

ORDER NO. KM40106816C7

F11

Service Manual

Telephone Equipment

KX-TC1503B / KX-TC1503W

900MHz Digital Cordless Answering System

Black Version

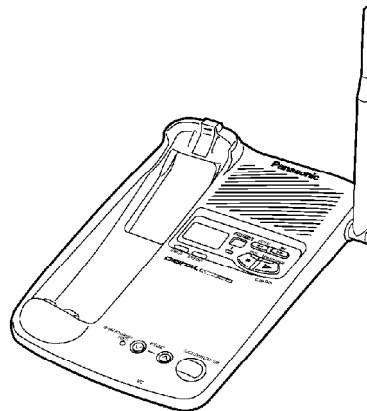
White Version

(for U.S.A.)

(for Panama)



(Handset)



(Base Unit)

SPECIFICATIONS

SPECIFICATIONS

	Base Unit	Handset
Power Source:	AC Adaptor (KX-TCA1-G)	Rechargeable Ni-Cd battery
Receiving Frequency:	22 channels within 902.00~928.00 MHz	22 channels within 902.00~928.00 MHz
Receiving Method:	Double super heterodyne	Double super heterodyne
Transmitting Frequency:	22 channels within 902.00~928.00 MHz	22 channels within 902.00~928.00 MHz
Oscillation Method:	PLL synthesizer	PLL synthesizer
Tolerance of OSC Frequency:	4.096 MHz	4.096 MHz
Modulation Method:	TDD-FSK	TDD-FSK
Spread spectrum Method:		
Chip rate		
ID Code:	28-bit	28-bit
Dial Mode:	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse
Redial:	Up to 32 digits	Up to 32 digits
Speed Dialer:		Up to 22 digits
Power Consumption:		14 days at Standby, 6 hours at Talk
Dimension (H × W × D):	3 11/32" × 7" × 8 1/4" (85 × 178 × 210mm)	1 5/8" × 2 5/32" × 9 7/16" (41 × 55 × 240 mm)
Weight	0.95 lbs. (430 g)	0.48 lbs. (216g) with battery

Design and specifications are subject to change without notice.

© 2001 Kyushu Matsushita Electric Co., Ltd. All rights reserved.

Unauthorized copying and distribution is a violation of law.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When replacing, the following precautions will help prevent recurring malfunctions.

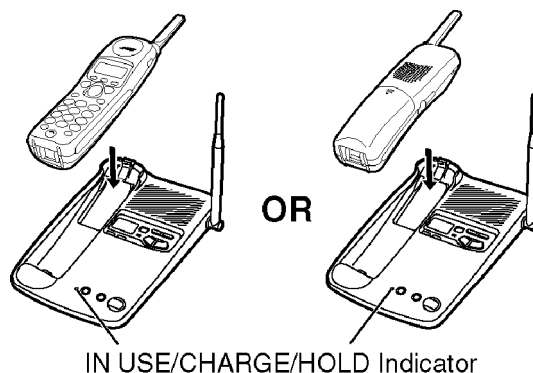
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work table.
4. Do not grasp IC or LSI pins with bare fingers.

1. STANDARD BATTERY LIFE

Battery Charge

Place the headset on the base unit and charge the battery for about 15 hours before initial use.

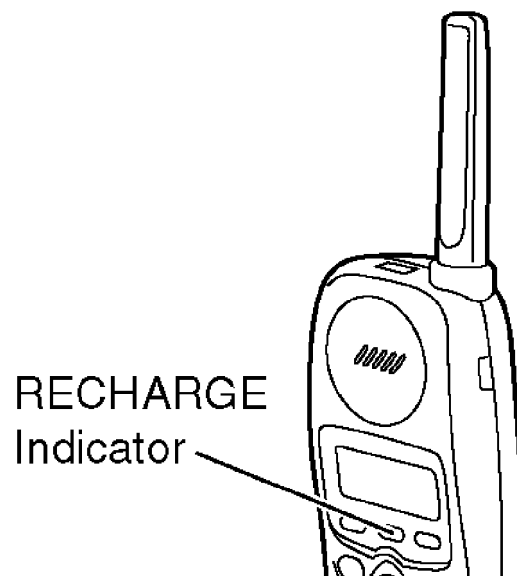
- The IN USE/CHARGE/HOLD indicator lights.



Recharge

When the RECHARGE indicator flashes, or the unit beeps intermittently, recharge the battery for about 15 hours.

- If you DO NOT recharge the handset battery for more than 15 minutes, the RECHARGE indicator will continue to flash.



Battery information

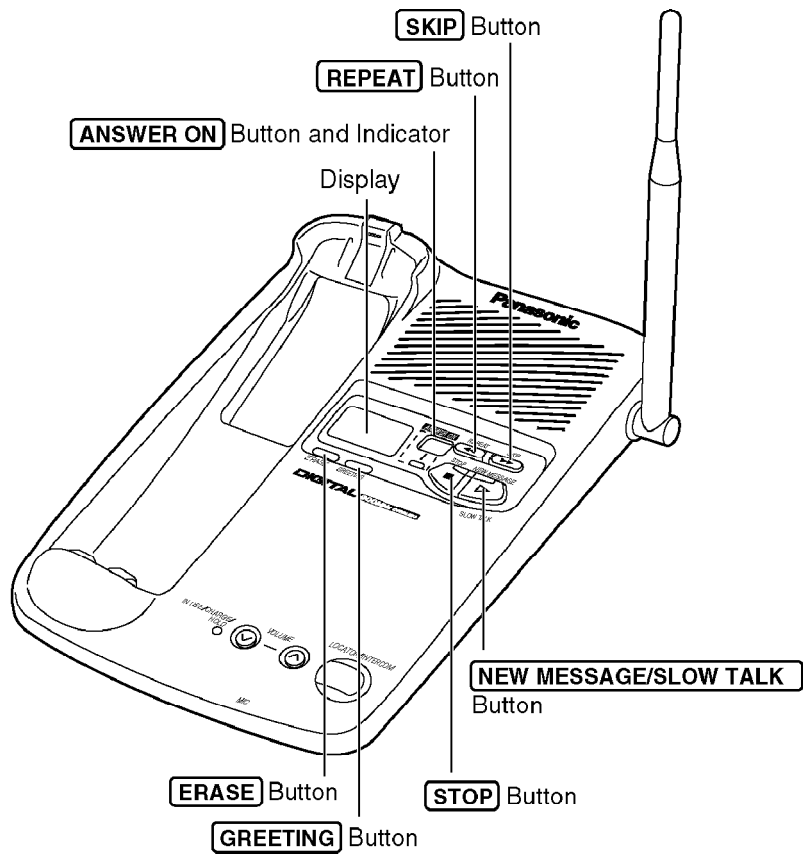
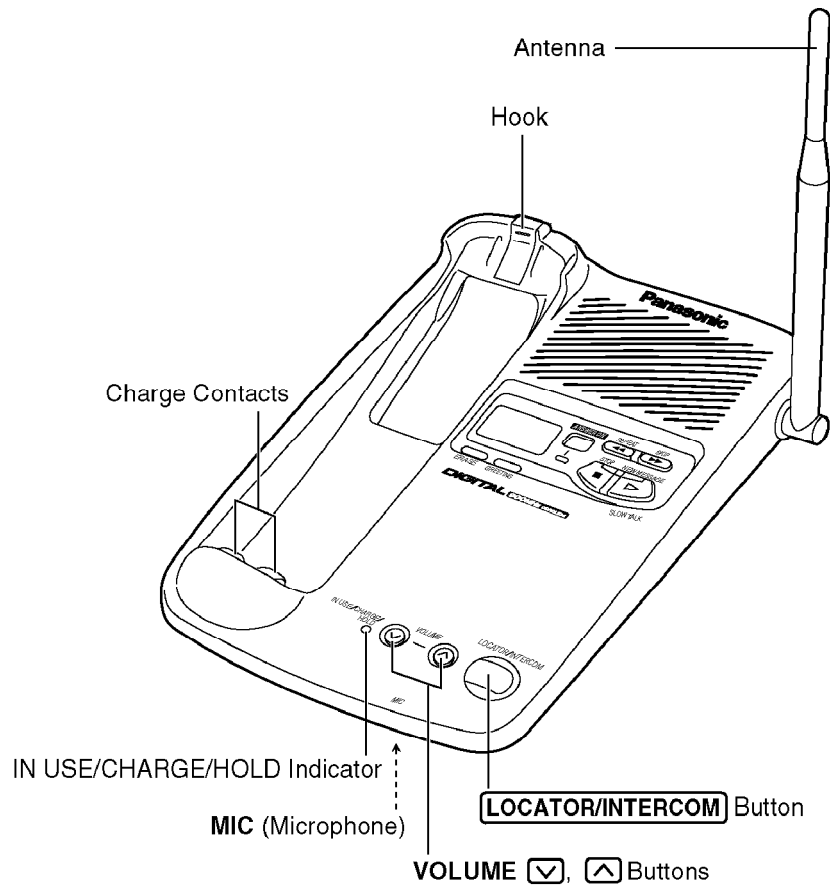
After your Panasonic battery is fully charged;

Operation	Approx, battery life
While in use (TALK)	Up to about 6 hours
While not in use (Standby)	Up to about 14 days

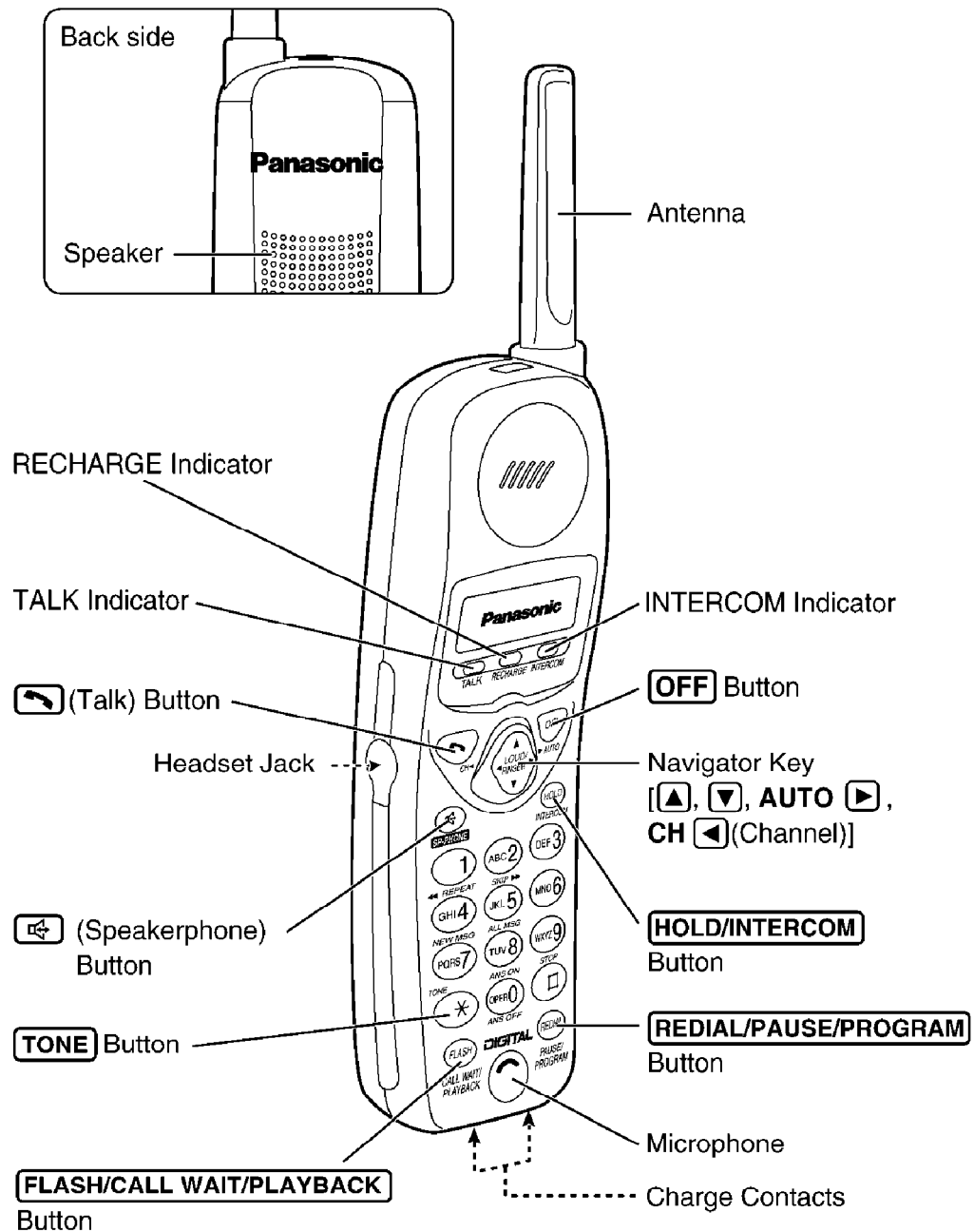
- Battery life may be shortened depending on usage condition and ambient temperature.
- **Clean the handset and the base unit charge contacts with a soft, dry cloth. Clean if the unit is subject to grease, dust or high humidity.** Otherwise the battery may not charge properly.
- If the battery is fully charged, you do not have to place the handset on the base unit until RECHARGE indicator flashes. This will maximize the battery life.
- The battery cannot be overcharged.

2. LOCATION OF CONTROLS

2.1. Base unit

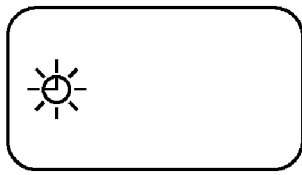


2.2. Handset

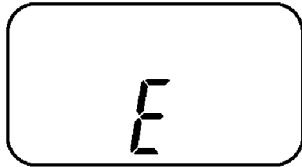


3. DISPLAY

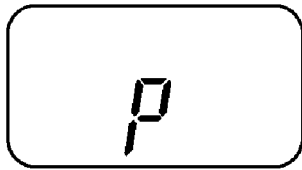
3.1. Base Unit Display



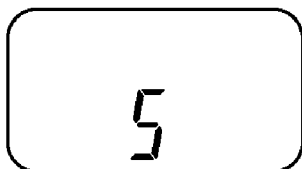
The clock needs adjusting.



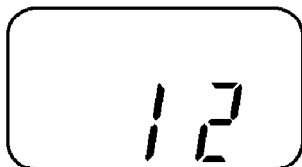
Your greeting message was not recorded correctly. Record it again.



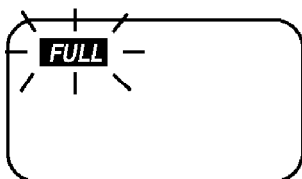
The unit is in the answering system programming mode.



The speaker volume level is set to "5".
You can select:
—9 levels (0-8) are available while using the answering system.
—8 levels (1-8) are available while using the intercom.



12 messages have been recorded.

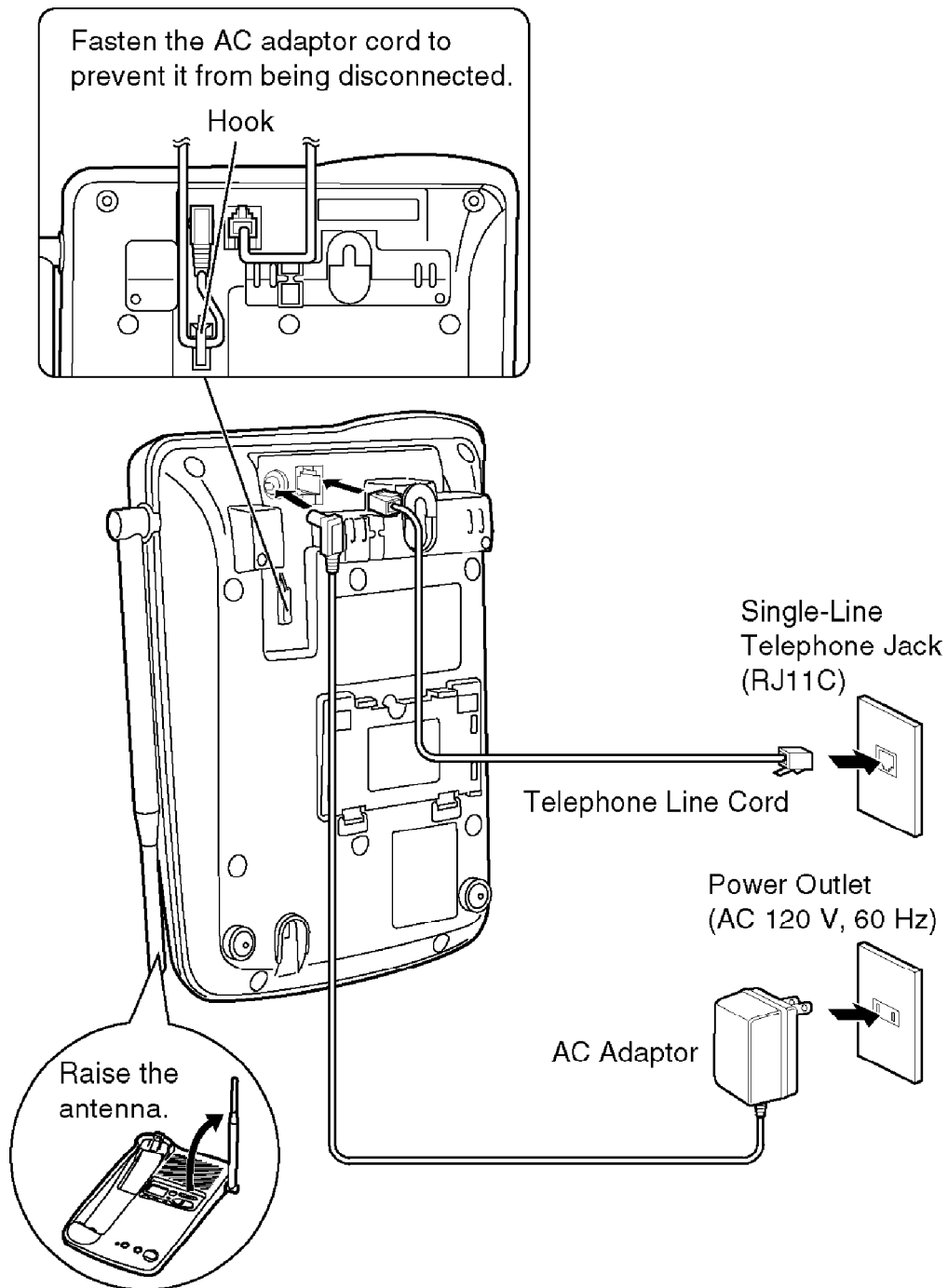


Memory is full. Erase some, or all, of the messages.



The recording time is set to "greeting only".
(The display is blank.)

4. CONNECTIONS



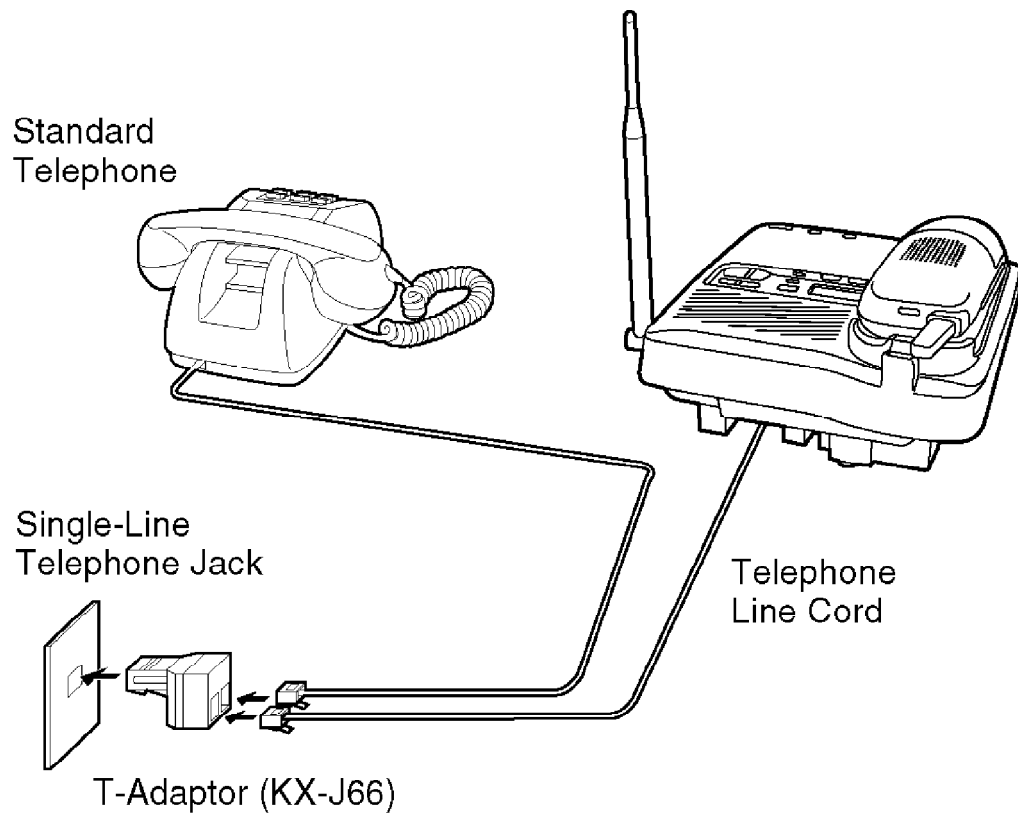
Note:

- **USE ONLY WITH Panasonic AC ADAPTOR KX-TCA1-G.**
- **The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)**

4.1. Adding Another Phone

This unit will not function during a power failure. To connect a standard telephone on the same

line, use the Panasonic T-adaptor KX-J66.



5. OPERATION

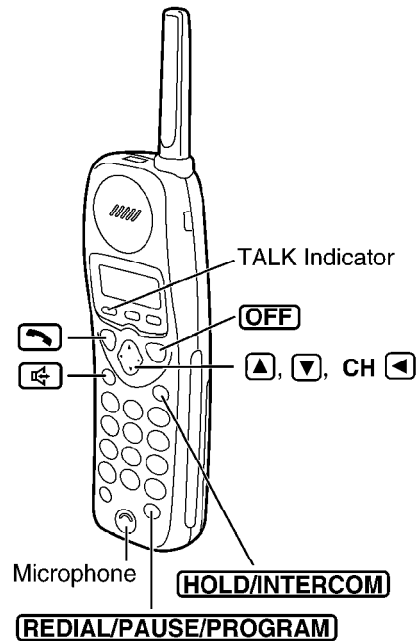
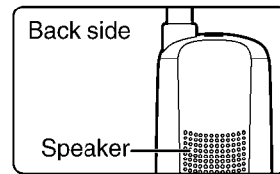
5.1. Making Calls

- 1 Press .
 - The TALK indicator lights.
- 2 Dial a telephone number.
- 3 To hang up, press **OFF** or place the handset on the base unit.
 - The TALK indicator light goes out.

•If an alarm tone sounds in step 1, move closer to the base unit or place the handset on the base unit, and try again.

To have a hands-free phone conversation (Using Digital Duplex Speakerphone)

- 1 Press .
 - The TALK indicator lights.
- 2 Dial a telephone number.
- 3 When the other party answers, talk into the microphone.
- 4 To hang up, press **OFF** or place the handset on the base unit.
 - The TALK indicator light goes out.



Hands-free Digital Duplex Speakerphone

For best performance, please note the following:

- Talk alternately with caller in a quiet room.
- If the other party has difficulty hearing you, press  to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press  to decrease the speaker volume.
- While talking using , you can switch to the hands-free phone conversation by pressing . To switch back to the receiver, press .

To redial the last number dialed

Press  or  ➔ **REDIAL/PAUSE/PROGRAM**.

To adjust the receiver volume (HIGH, MEDIUM or LOW) or speaker volume (6 levels) while talking

Press  or  while talking.

While using 

- Each time you press  or , the volume level will change from MEDIUM (preset) to HIGH or LOW.
- When you replace the battery, the selected receiver volume setting will return to the factory set (MEDIUM). Reprogram if necessary.

While using 

- Each time you press  or , the volume level will change from level 1 to level 6. Your phone comes from the factory set to level 3.

To put a call on hold

Press **HOLD/INTERCOM**.

- The TALK indicator flashes.
- The IN USE/CHARGE/HOLD indicator on the base unit flashes.
- If you do not press any key more than 6 minutes, an alarm tone will sound.
- If you do not press any key more than 10 minutes after holding a call, a line will be disconnected.

To release the hold

Press  or , or lift the handset off the base unit.

- If another phone is connected on the same line, you can also release the hold by lifting its handset.

If noise interferes with the conversation

Press **CH**  to select a clearer channel or move closer to the base unit.

5.2. Answering Calls

- 1 If the handset is off the base unit;
Press .

You can also answer a call by
pressing any dialing button  to
,  or  (—Any Key Talk).

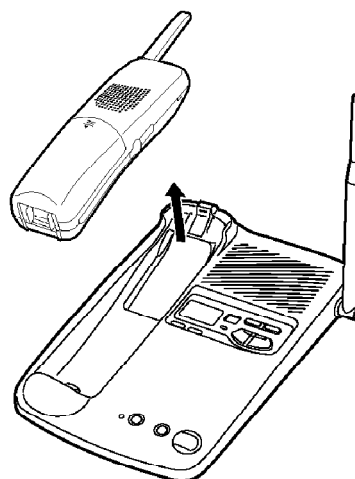
OR

Press , and when the other
party answers, talk into the
microphone.



OR

If the handset is on the base unit,
just lift up.



- 2 To hang up, press  or
place the handset on the base
unit.

When an optional headset is connected, make sure to use the headset
to talk with the caller. If you want to have a normal cordless phone
conversation, disconnect the headset.

5.3. Automatic Answering Operation

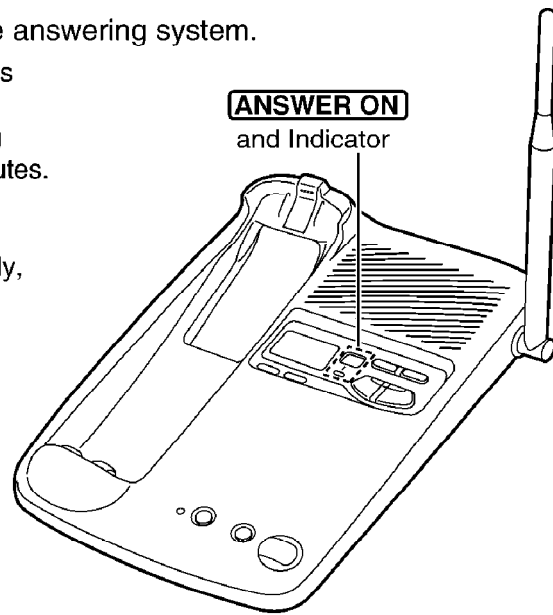
When the unit answers a call, a greeting message is played and the
caller's message is recorded.

- The total recording time (including greeting message) is **about 15 minutes**. If messages are recorded in noisy rooms, the time may be shortened by up to 3 minutes.
- A maximum of 64 messages (including greeting message) can be recorded.

5.3.1. Setting the Unit to Answer Calls

Press **ANSWER ON** to turn on the answering system.

- The indicator lights and “Answer set” is heard.
- The unit will announce the remaining recording time if it is less than 5 minutes.
- If you hear “Memory full”, “**FULL**” is displayed on the base unit and the ANSWER ON indicator flashes rapidly, erase some, or all, of the messages.



- If you do not want the unit to answer calls, press **ANSWER ON** again to turn off the answering system. The indicator light goes out and “Answer off” is heard.
- You can also turn on the answering system remotely using any other phone.

Monitoring incoming calls

While a call is being recorded, you can monitor it through the speaker.

To answer the call with the speakerphone, press  or  on the handset. The unit stops recording.

5.4. Listening to Messages

You can see the total number of recorded messages on the display.
If the ANSWER ON indicator flashes, new messages have been recorded.

Listening to only new messages

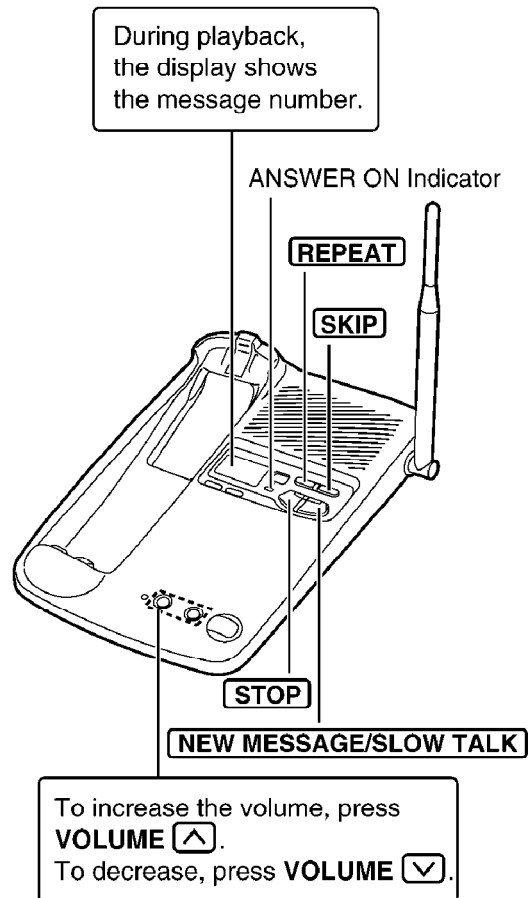
Press **NEW MESSAGE/SLOW TALK** briefly.

- The unit announces the number of new messages and plays them back.

Listening to all recorded messages

Press and hold **NEW MESSAGE/SLOW TALK** until playback starts.

- At the end of the last message, "End of final message" is heard. The unit will announce the remaining recording time if it is less than 5 minutes.



Slow Talk Message Playback

For easier listening of recorded messages, you can slow down the playback speed by pressing **NEW MESSAGE/SLOW TALK** during playback. Each time you press the button, the playback speed will change to slow/normal.

Press **NEW MESSAGE/SLOW TALK** during playback.

- The playback speed will slow down by 30%.
- To return to the normal speed, press **NEW MESSAGE/SLOW TALK** again during playback.
- The playback speed will return to normal after playing back all messages.

5.4.1. During playback

To repeat message	Press REPEAT briefly. • If you press within 5 seconds of playback, the previous message will be played.
To skip message	Press SKIP briefly.
To stop operation	Press STOP . • To resume playback, press NEW MESSAGE/SLOW TALK. • If you do not press any button for 60 seconds or if you press STOP again, the unit will return to the standby mode.

5.5. FLASH Button

Pressing **FLASH/CALL WAIT/PLAYBACK** allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional) such as call waiting.

Selecting the flash time

The flash time depends on your telephone exchange or host PBX. You can select the following flash times: "90, 100, 110, 250, 300, 400, 600, 700 ms (milliseconds)", **using the handset near the base unit.** Your phone comes from the factory set to "700 ms".

The TALK indicator light must be off before programming.

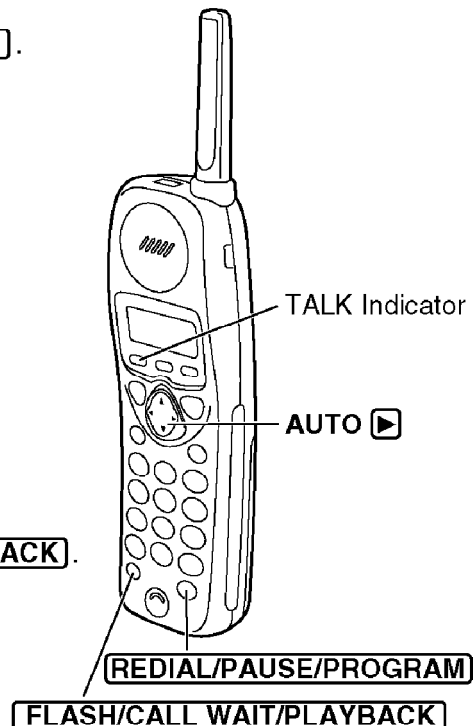
- 1 Press **REDIAL/PAUSE/PROGRAM**.
 - The TALK indicator flashes.

- 2 Press a dialing button (**1** to **8**).

1 : 90 ms	2 : 100 ms
3 : 110 ms	4 : 250 ms
5 : 300 ms	6 : 400 ms
7 : 600 ms	8 : 700 ms

- 3 Press **AUTO** .

- 4 Press **FLASH/CALL WAIT/PLAYBACK**.
 - A beep sounds.



- If 3 beeps sound in step 4,
 - a wrong key was pressed. Start again from step 1.
 - the handset is too far from the base unit. Move closer to the base unit or place the handset on the base unit. Start again from step 1.
- If you are connected via a PBX, a longer flash time may be necessary to use PBX functions (transferring a call, etc.). Consult your PBX installer for the correct setting.

6. DISASSEMBLY INSTRUCTIONS

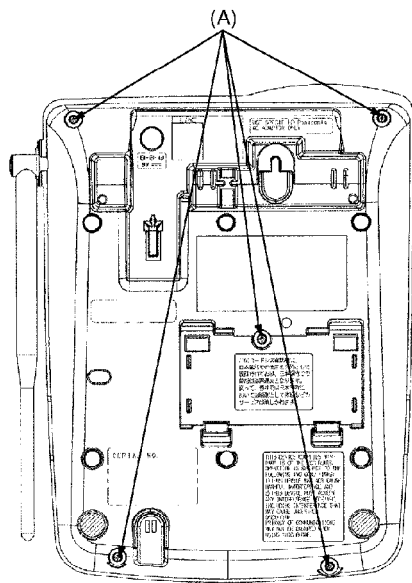
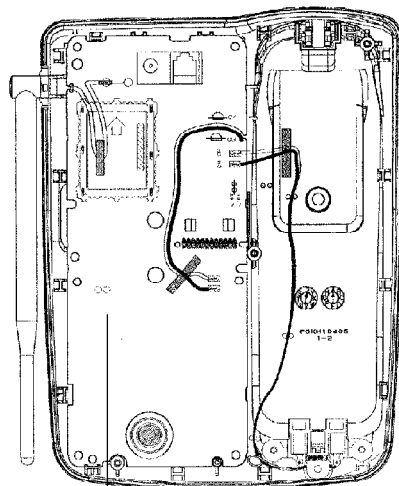


Fig. 1



Remove the P. C. Board

Fig. 2

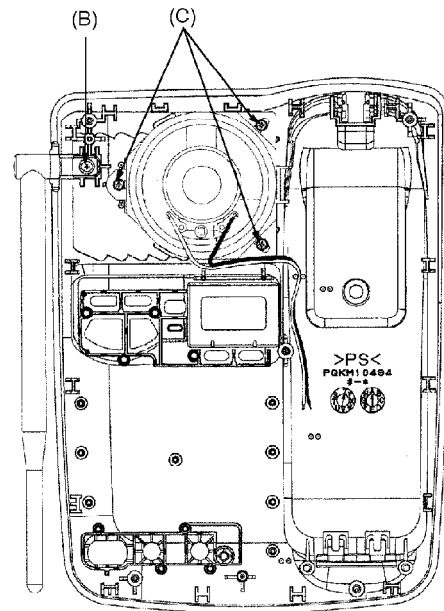


Fig. 3

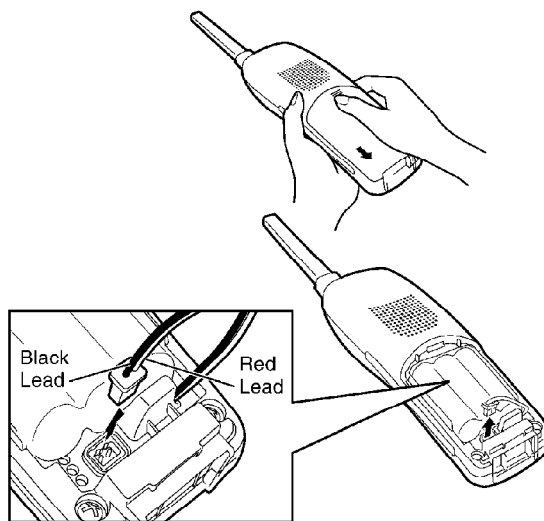


Fig. 4

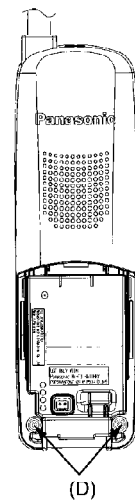


Fig. 5

Note: When opening the upper cabinet, be careful of the speaker lead wire.

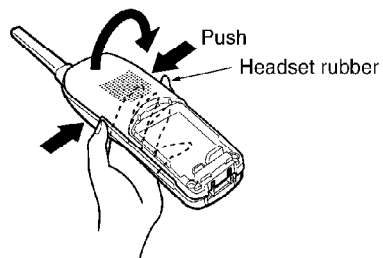


Fig. 6

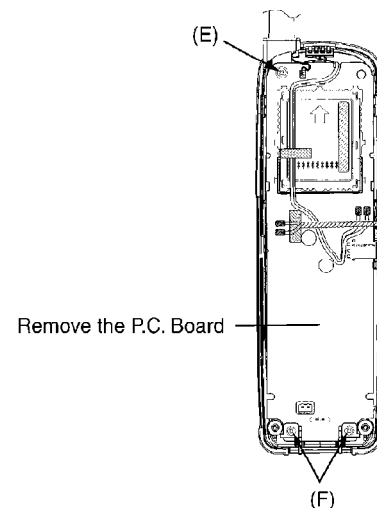
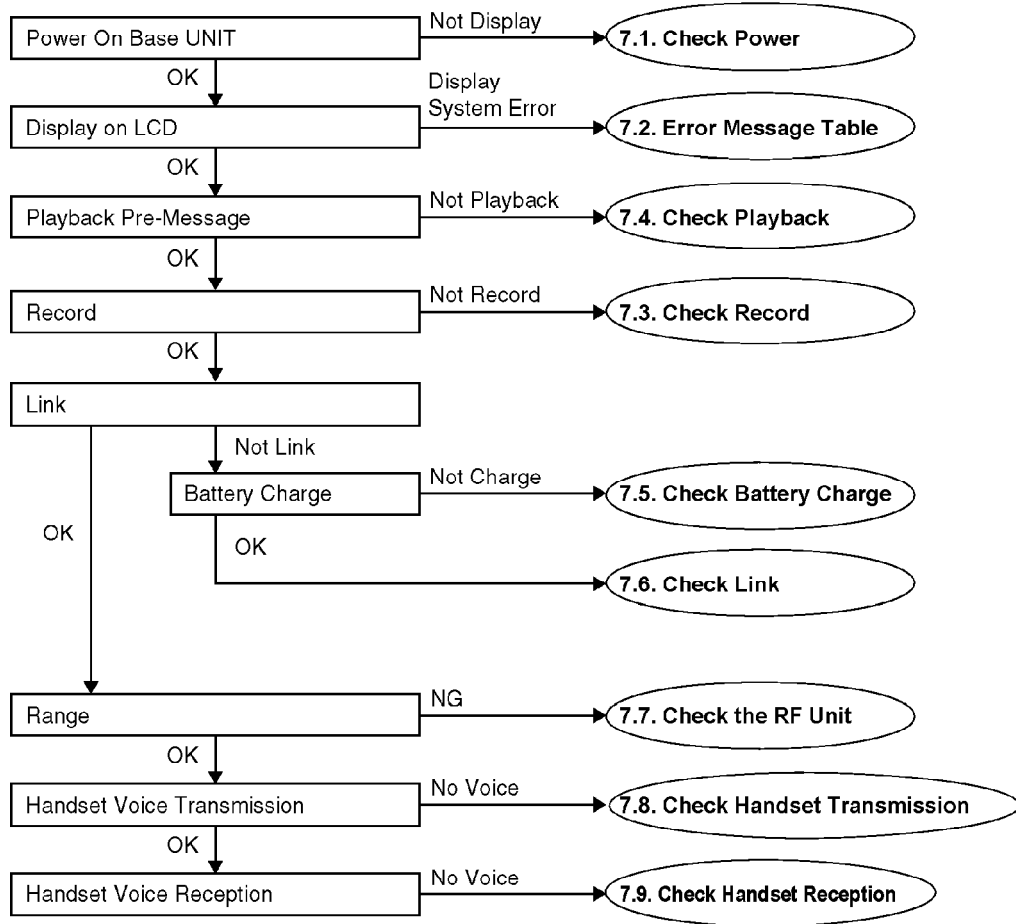


Fig. 7

Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 X 12).....(A) X 5
2	Main P.C. Board	Remove the P.C. Board
3	Antenna	Screw (2.6 X 12).....(B) X 1
	Speaker	Screws (3 X 8).....(C) X 3
4	Battery Cover	Remove the Battery Cover
5	Rear Cabinet	Screws (2.6 X 12).....(D) X 2
6	Rear Cabinet	Remove the Rear Cabinet
7	Main P.C. Board	Screw (2.6 × 12).....(E) × 1
		Screws (2.6 × 10).....(F) × 2
		Remove the lead
		Remove the P.C. Board

7. TROUBLESHOOTING GUIDE

MAIN



Cross Reference:

[Check Power](#) ()

[Error Message Table](#) ()

[Check Record](#) ()

[Check Playback](#) ()

[Check Battery Charge](#) ()

[Check Link](#) ()

[Check the RF Unit](#) ()

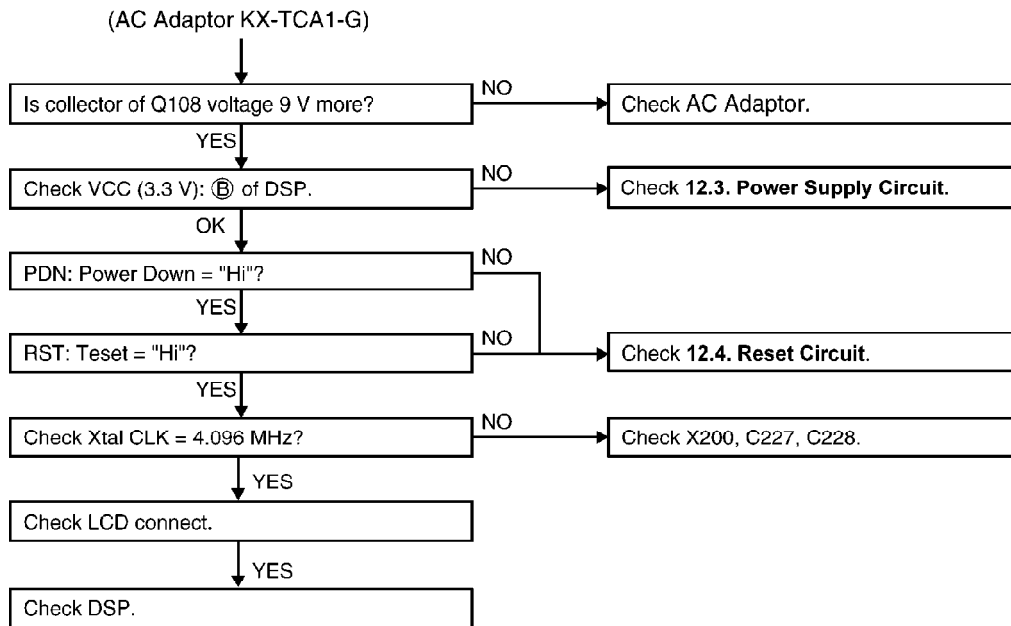
[Check Handset Transmission](#) ()

[Check Handset Reception](#) ()

7.1. Check Power

BASE UNIT

Is the AC Adaptor inserted into 120V outlet?



Cross Reference:

[Power Supply Circuit \(\)](#)

[Reset Circuit \(\)](#)

NOTE:

Flash Memory is IC300.

DSP is IC201.

7.2. Error Message Table

Display	Symptom	Remedy
E 1	The initialization was tried, but it could not be done.	1. Check the peripheral circuit of Flash Memory visually. 2. Confirm that the voltage is added to the power supply pin. If no voltage is detected, replace the Flash Memory because it might be defect. 3. Solder the Flash Memory again.
E 3 E 9	When the adjustment data was checked, an error was detected. (The adjustment data may not be written.)	
E 7	The defect of synthesized voice was detected. (The synthesized voice may not be written.)	
E 2	The defect of Flash Memory was detected.	When Flash Memory has the fatal detect, replace Flash Memory. This error hardly occurs.
E 4	The defect of DSP was detected. (The chip in DSP may have a defect.)	1. Confirm Pins of DSP or resoldering. 2. Confirm the oscillation frequency of DSP. If no frequency is found, replace DSP because it might be defect.
E 5 E 6	The defect of DSP was detected.	Replace DSP.

NOTE:

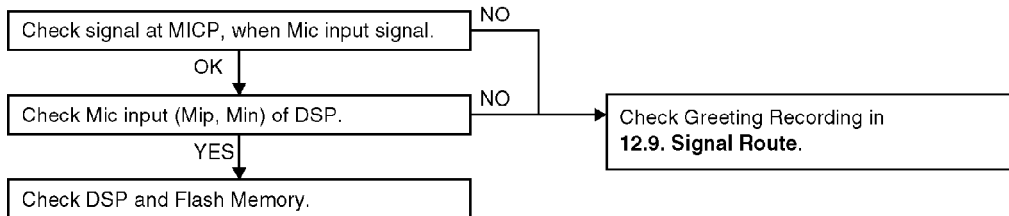
Flash Memory is IC300.

DSP is IC201.

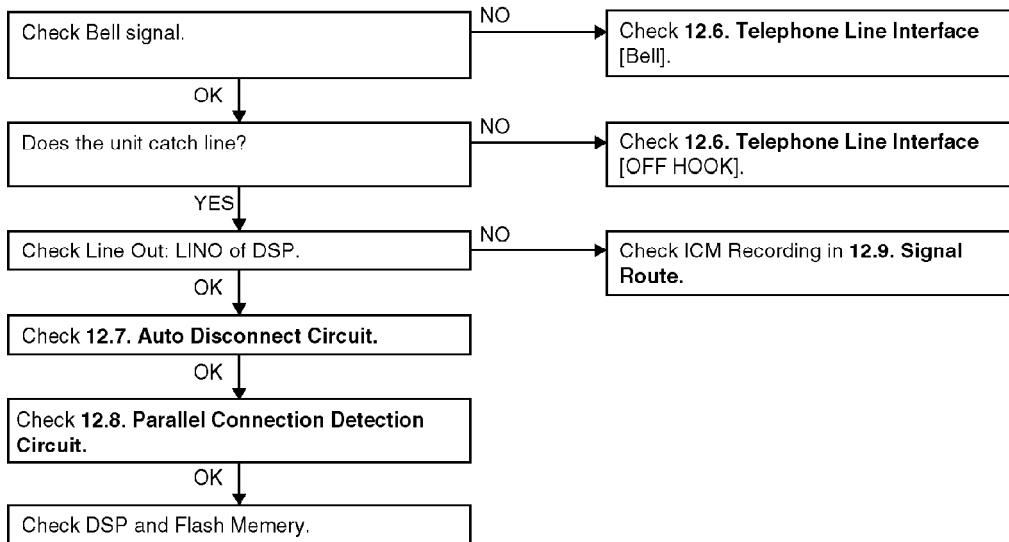
7.3. Check Record

BASE UNIT

Not record Greeting Message



Not record Incoming Message



Cross Reference:

[Telephone Line Interface \(\)](#)

[Auto Disconnect Circuit \(\)](#)

[Parallel Connection Detect Circuit \(\)](#)

[Signal Route \(\)](#)

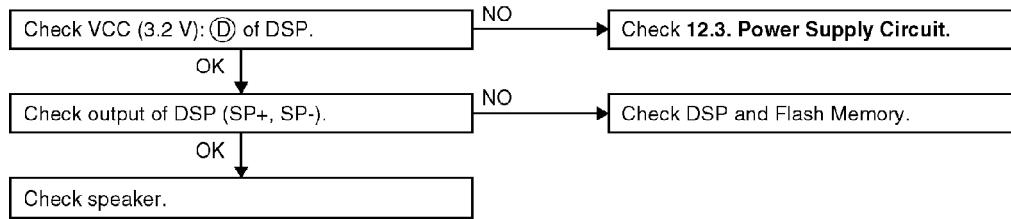
NOTE:

Flash Memory is IC300.

DSP is IC201.

7.4. Check Playback

BASE UNIT



Cross Reference:

[Power Supply Circuit](#) ()

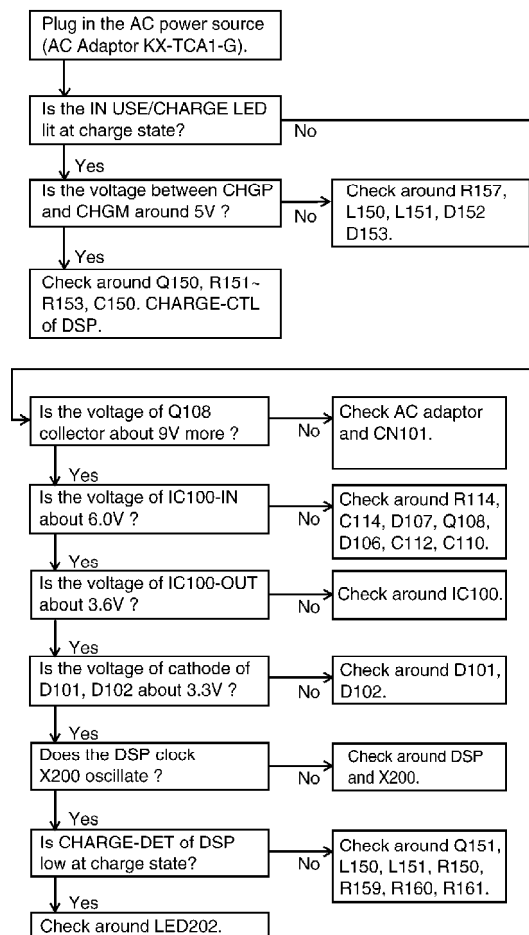
NOTE:

Flash Memory is IC300.

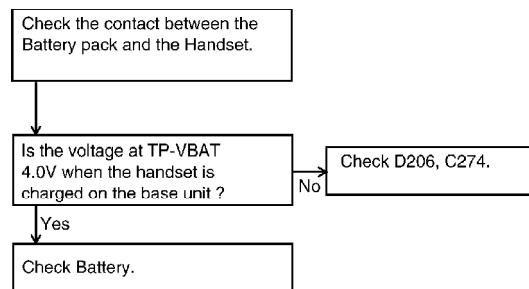
DSP is IC201.

7.5. Check Battery Charge

BASE UNIT



HANDSET



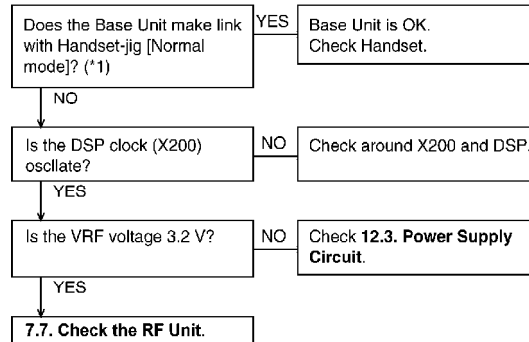
NOTE:

Flash Memory is IC300.

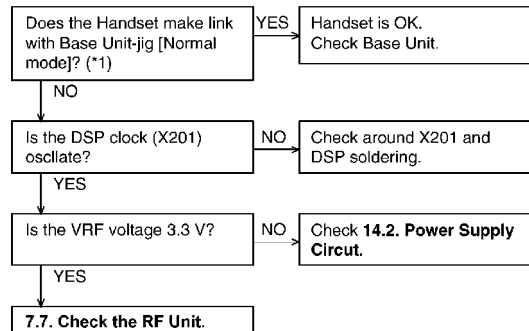
DSP is IC201.

7.6. Check Link

BASE UNIT



HANDSET



(*1) Refer to **Finding out the Defective Unit ()**.

Cross Reference:

Check the RF Unit ()

Power Supply Circuit ()

Power Supply Circuit ()

NOTE:

Flash Memory is IC300.

DSP is IC201.

7.7. Check the RF Unit

7.7.1. Finding out the Defective Unit

Prepare HS JIG (Handset-jig) and BS JIG (Base Unit-jig) 2). Place the HS JIG on the cradle of the base unit for checking, then confirm that they are linked. Place the handset for checking on the cradle of the BS JIG, then confirm that they are linked. How to confirm the link is as follows; press the TALK button and confirm that the LEDs of the base unit is turned ON.

7.7.2. Check Items

7.7.2.1. Handset-jig (HS JIG) for Base Unit

The handset unit jig also uses two modes: TEST LOW mode and NORMAL POWER mode.

(1) NORMAL POWER mode (Stand-By). In this mode the LCD will remain blank.

(2) TEST LOW mode. Place the portable unit on the base unit while pushing



and key at the same time within 5 seconds after Power supply the portable unit. Refer to

fixation CH table, figure 1 for the key. This test simulates the handset is at very large distance from the base unit and the TX signal from handset to base is very small.

Procedure: First place handset jig on base under test to charge (exchange security code); press CLEAR and then TALK to operate. The LCD will show TALK. This means that the base unit sensitivity is OK.

* HS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.

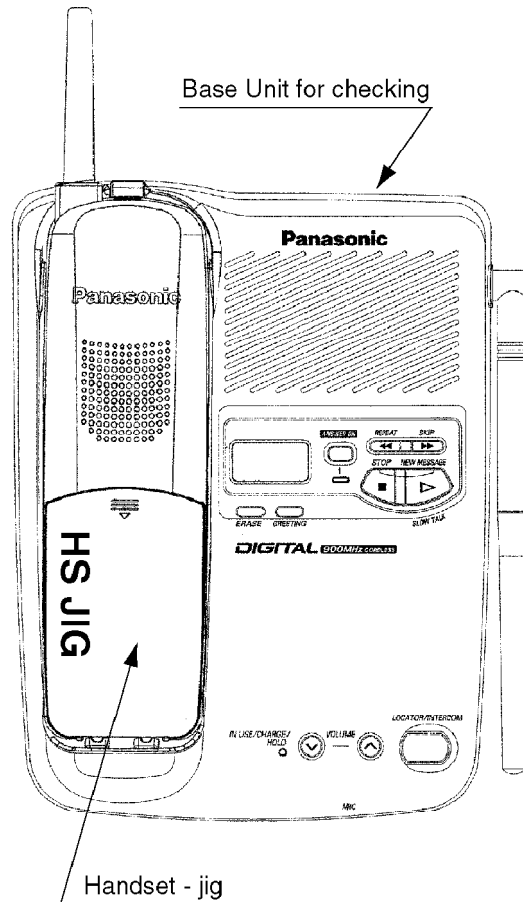
NOTES:

1) If when setting the handset to TEST LOW mode, if handset beeps 3 times and the LCD shows "No link to base. Place on cradle and try again", press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.

2) Only KX-TC1703 with marks HS JIG/BS JIG can be used for troubleshooting. However, regular production set also can be used as a JIG.

Fixation CH	Figure 1	
CH	POWER	making key
1CH	"Lo"	"FLASH" + "1"
3CH	"Lo"	"FLASH" + "2"
5CH	"Lo"	"FLASH" + "3"
7CH	"Lo"	"FLASH" + "4"
9CH	"Lo"	"FLASH" + "5"
11CH	"Lo"	"FLASH" + "6"
13CH	"Lo"	"FLASH" + "7"
15CH	"Lo"	"FLASH" + "8"
17CH	"Lo"	"FLASH" + "9"
19CH	"Lo"	"FLASH" + ""
21CH	"Lo"	"FLASH" + "0"

Fig. Using TC1703 Handset-jig.



* KX-TC1703 is used as the jig.

7.7.2.2. Base Unit - jig (BS JIG) for Handset

The base unit jig uses two modes: **NORMAL POWER** mode and **TEST POWER** mode.

(1) **NORMAL POWER** mode. This test simulates the handset is at normal/close distance. The base unit is in **NORMAL POWER** mode right after the AC adapter has been inserted.

(2) **TEST LOW (POWER)** mode. Place the portable unit on the base unit while pushing

FLASH and  key at the same time within 5 seconds after Power supply the

portable unit. Refer to fixation CH table, figure 1 for the  key. This test simulates the handset is at very large distance from the base unit and the TX signal from base to handset is very small.

Procedure: First, place handset under test to charge (exchange security code), then remove handset from base after you hear a beep. Press **TALK** button on handset and if it links with the base, then this handset sensitivity is OK.

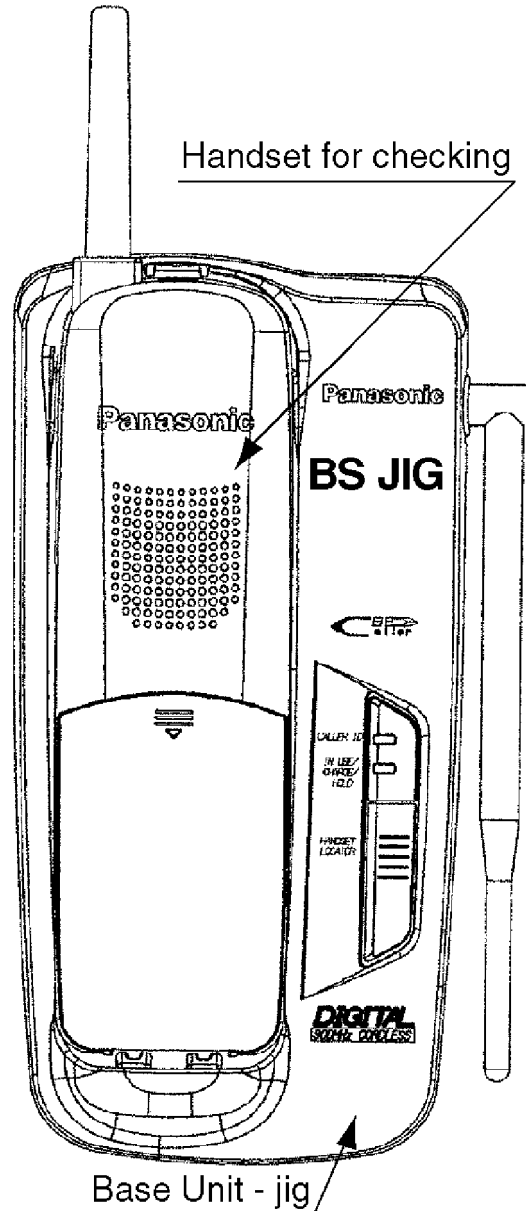
* BS JIG becomes [**NORMAL POWER**] mode immediately after the power supply turning on.

NOTES:

1) If when setting the base to TEST LOW mode, if handset beeps 3 times, press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.

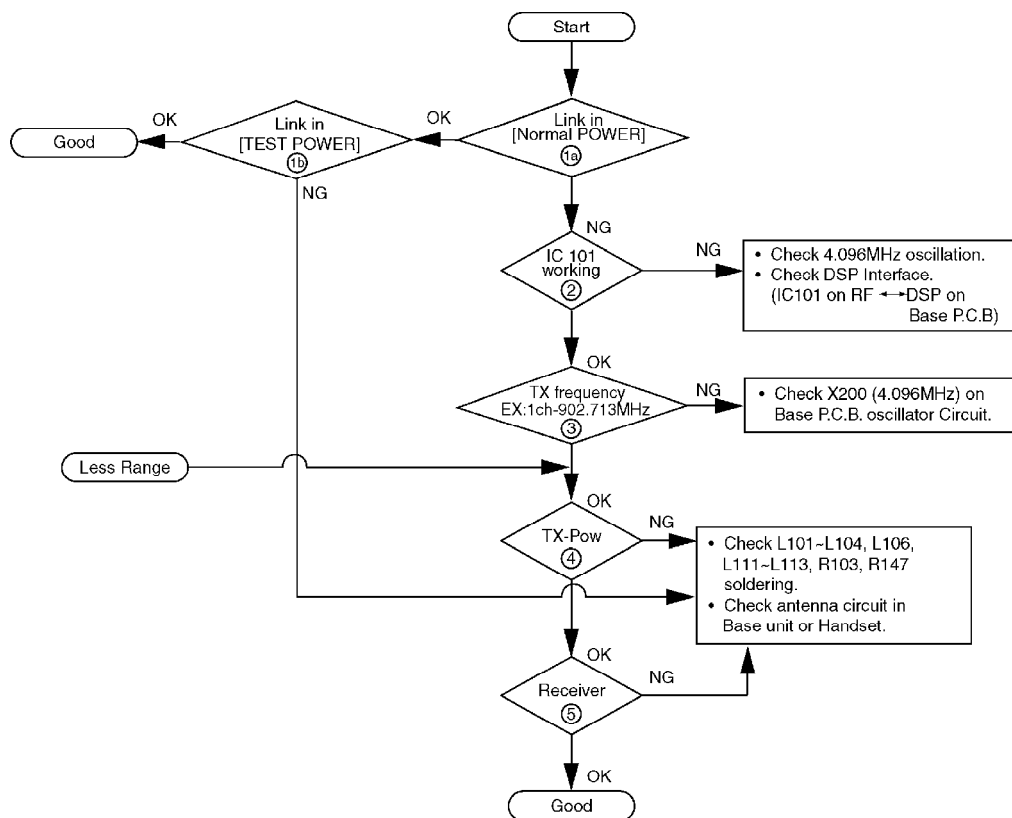
2) Only KX-TC1703 with marks BS JIG/HS JIG can be used for troubleshooting. However, regular production set also can be used as a JIG.

Fig. Using TC1703 Base Unit-jig.



* KX-TC1703 is used as the jig.

7.7.3. RF Check Flowchart



①a~⑤: Details of confirmation items are following in “**Check Table for RF Block** ()”.

NOTE:

Flash Memory is IC300.

DSP is IC201.

7.7.4. Check Table for RF Block

No	Item		BS (Base unit) (*1)	HS (Handset) (*1)
1a.	Link confirmation [NORMAL POWER]	Procedure	1. Put "HS JIG" on BS. 2. Set MODE to [NORMAL POWER] position of "HS JIG". 3. Press [TALK] key of "HS JIG" to establish link.	1. Put HS on "BS JIG". 2. Set MODE to [NORMAL POWER] "BS JIG". 3. Press [TALK] key of "HS" to establish link.
1b.	Link confirmation [TEST POWER]	Procedure	1. Change MODE to [TEST POWER] position of "HS JIG". 2. Press [TALK] key of "HS JIG" to establish link about 30cm away from "BS".	1. Change MODE to [TEST POWER] "BS JIG". 2. Press [TALK] key of "HS" to establish link about 30cm away from "BS JIG".
2	IC101 working confirmation	Procedure	1. Set Test-mode [Continuous Send Low Power].(*3) 2. Confirm oscillate signal (4.096 MHz at Pin 33). (*4)	1. Set Test-mode [Continuous Send Low Power].(*3) 2. Confirm oscillate signal (4.096 MHz at Pin 33). (*4).
		Check point	1. Check Pin 33 oscillator. 2. Check DSP interface(IC101 ↔ DSP/BS) (*5).	1. Check Pin 33 oscillator. 2. Check DSP interface(IC101 ↔ DSP/HS) (*5).
3	TX frequency confirmation	Procedure	1. Set Test-mode [Continuous Send].(*3) 2. Confirm TX-carrier frequency (1CH = 902.713MHz ± 20kHz).	1. Set Test-mode [Continuous Send].(*3) 2. Confirm TX-carrier frequency (1CH = 902.713MHz ± 20kHz).
		Check point	1. Check DSP or X200 oscillator Circuit.	1. Check DSP or X201 oscillator Circuit.
4	TX Power confirmation	Procedure	1. Put RF wire to ANT and ANT_GND (See Base Unit Reference Drawing). Connect this wire Marconi or Spectrum Analyzer. 2. Set Test-mode. 3. Confirm TX power level within -3±5dBm (*2) (0.158~1.58mW)	1. Put RF wire to ANT and ANT_GND (See Handset Reference Drawing). 2. Set Test-mode. 3. Confirm TX power level within -3±5dBm (*2) (0.158~1.58mW)
		Check point	1. Check C102~C103, C161, L102, L111, R147 soldering. 2. Check Antenna in BS.	1. Check C102~C103, C161, L102, L111, R147 soldering. 2. Check Antenna in HS.
5	Receiver confirmation	Procedure	1. Put "HS JIG" on BS. 2. Set MODE to [NORMAL POWER] position of "HS JIG". 3. Press [TALK] key of "HS JIG" to establish link. 4. Change MODE to [TEST POWER] position of "HS JIG". 5. Press [TALK] key of "HS JIG" to establish link about 30cm away from "BS".	1. Put HS on "BS JIG". 2. Set MODE to [NORMAL POWER] "BS JIG". 3. Press [TALK] key of "HS" to establish link. 4. Change MODE to [TEST POWER] "BS JIG". 5. Press [TALK] key of "HS" to establish link about 30cm away from "BS JIG".
		Check point	1. Check L103, L104, L106, L111~L113, X101, C103~C106, C110, C118, R103 soldering. 2. Check Antenna in BS.	1. Check L103, L104, L106, L111~L113, X101, C103~C106, C110, C118, R103 soldering. 2. Check Antenna in HS.

(*1) BS: Base unit, HS: Handset unit, HS JIG: Handset-jig, BS JIG: Base unit-jig

(*2)<Marconi setting>

TX Freq.; 902.713MHz mode; WB

<Spectrum analyzer setting>

Freq. 902.713MHz Span 10MHz

RBW 1MHz or above VBW same as RBW

(*3)See [TEST MODE](#) ().

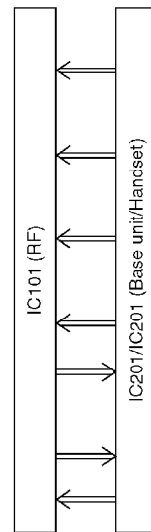
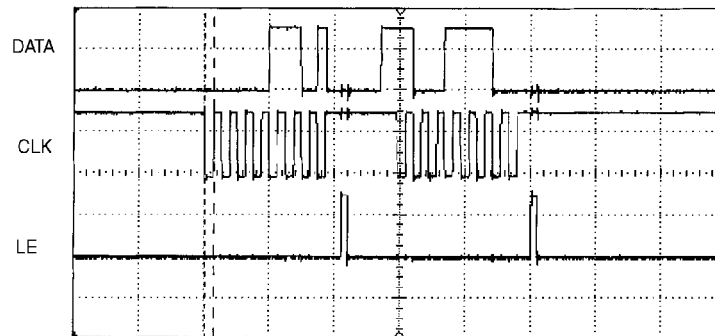
(*4)See [RF-DSP interface signal wave form](#) ().

(*5)See [Base Unit Reference Drawing](#) ().

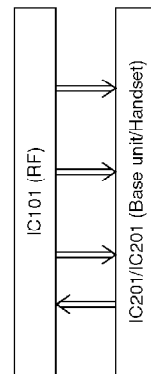
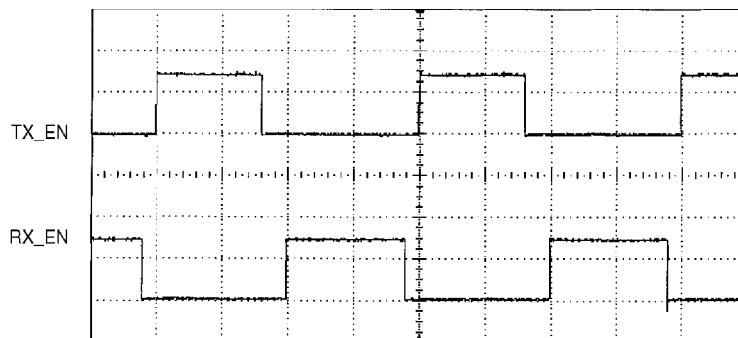
NOTE:
Flash Memory is IC300.
DSP is IC201.

7.7.5. RF-DSP interface signal wave form

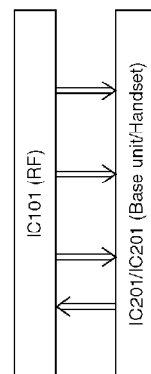
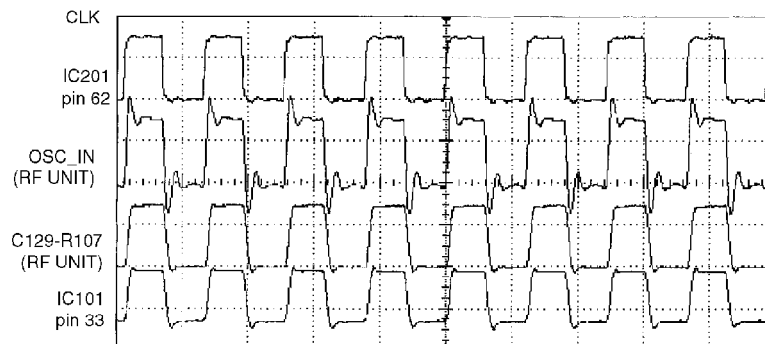
(1) Serial control line
<Standby mode>



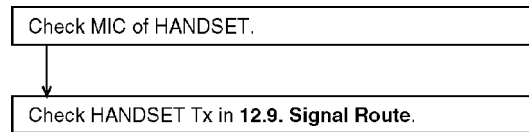
(2) Control line <Talk mode>
<Tx & Rx Power SW>



<Referenc clock 4.096MHz>



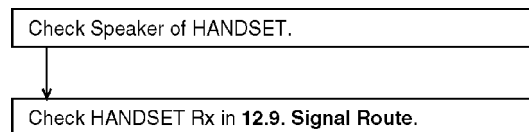
7.8. Check Handset Transmission



Cross Reference:

[Signal Route](#) ().

7.9. Check Handset Reception



Cross Reference:

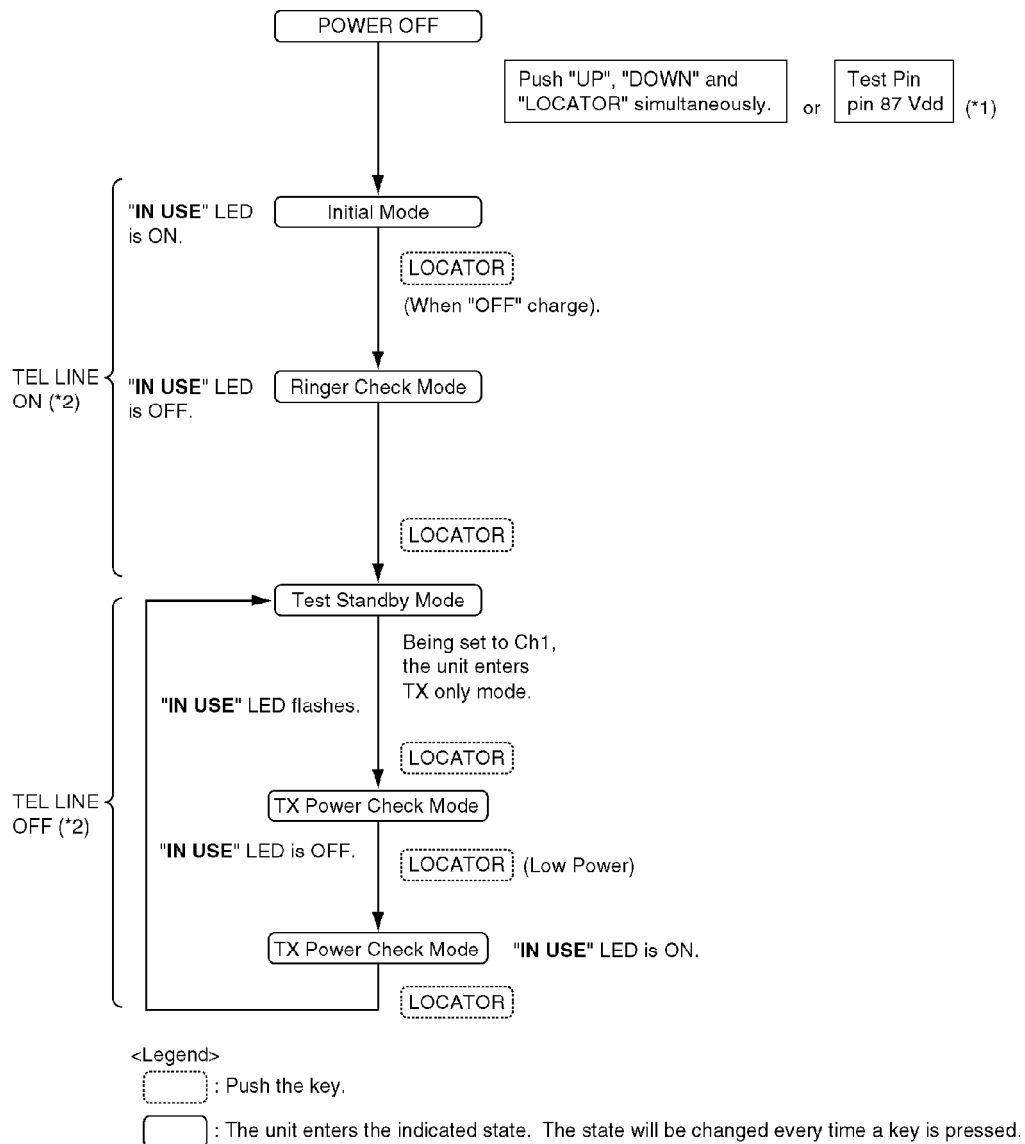
[Signal Route](#) ().

NOTE:

When checking the RF UNIT, Refer to [Check the RF Unit](#) ()

8. TEST MODE

8.1. Test mode flow chart for Base Unit



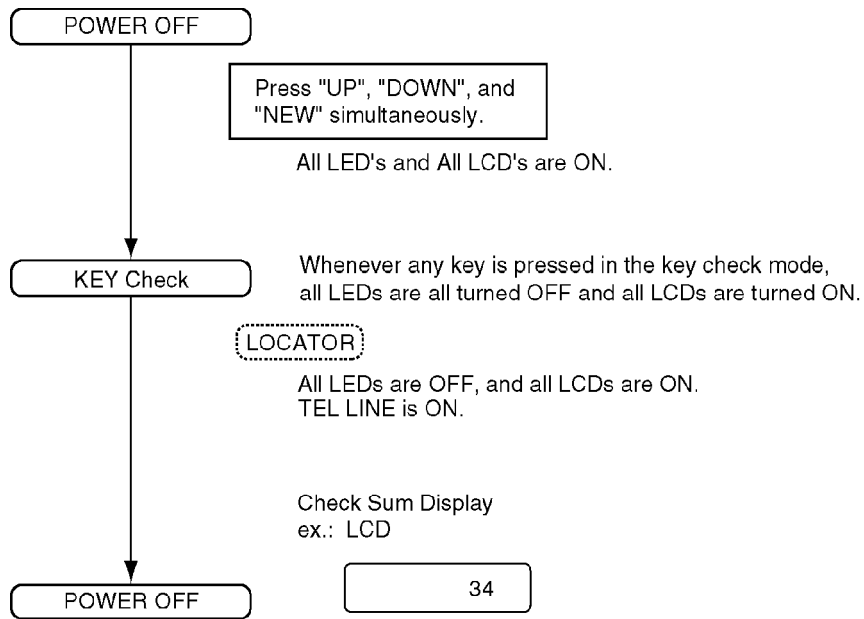
(*1) See **Base Unit Reference Drawing ()** - Should return to OPEN after entering the Test mode.

(*2) It shows whether the telephone line is connected or not.

-ON: OFF HOOK.

-OFF: ON HOOK

8.2. TAM Test mode flow chart

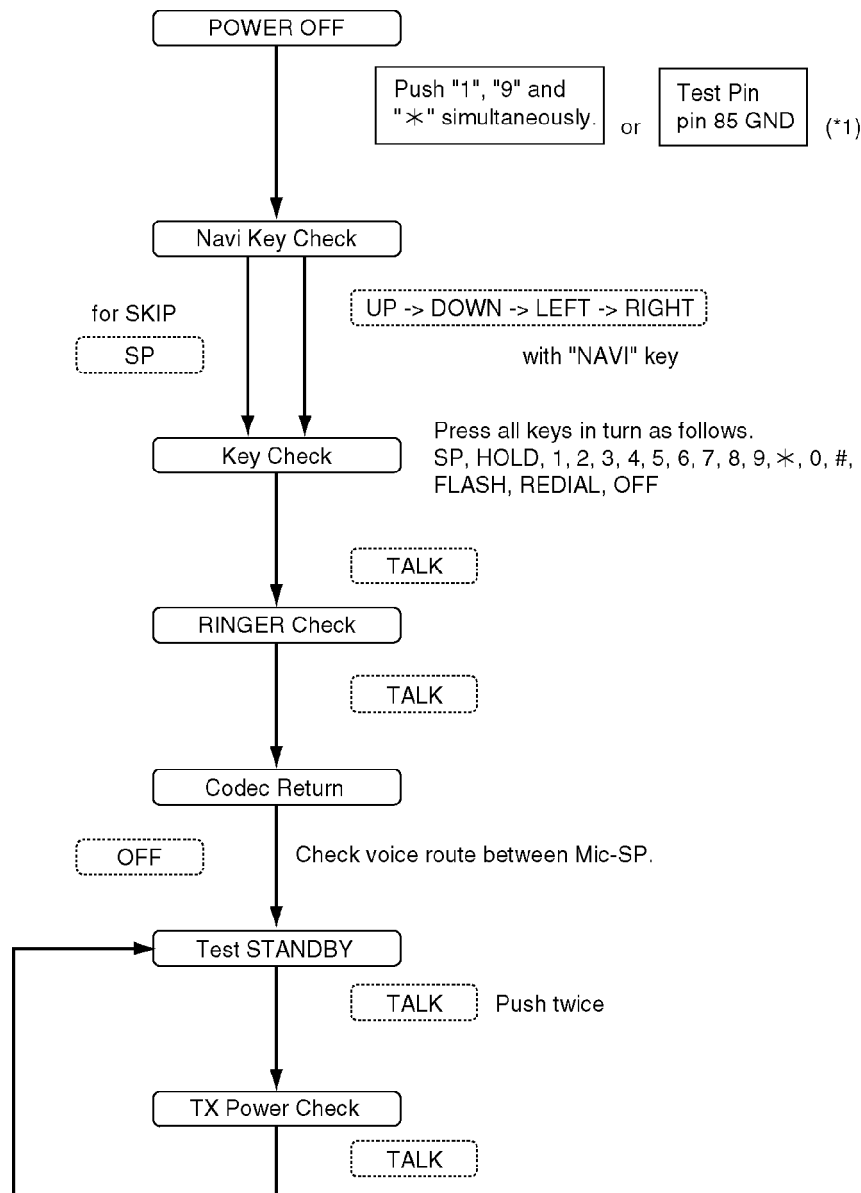


<Legend>

 : Push the key.

 : The unit enters the indicated state. The state will be changed every time a key is pressed.

8.3. Test mode flow chart for Handset



<Legend>

: Push the key.

: The unit enters the indicated state. The state will be changed every time a key is pressed.

(*1) See [Handset Reference Drawing](#) ().---Should return to OPEN after entering the Test mode.

8.4. X101 Check

The confirmation is made under the Continuous Send mode of TEST MODE.

Equipment: Frequency counter

TP for adjustment: TP_ANT

Measure range: 902.713 MHz $\pm$ 5 kHz (1ch) at Test Standby mode in [TEST MODE](#) ().

8.5. Base Unit Reference Drawing

8.6. Handset Reference Drawing

8.7. FREQUENCY TABLE

(TDD: time division duplex)

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	902.713	12	925.013
2	902.940	13	925.241
3	903.168	14	925.468
4	903.395	15	925.696
5	903.623	16	925.923
6	903.850	17	926.151
7	904.078	18	926.378
8	904.305	19	926.606
9	904.533	20	926.833
10	904.761	21	927.061
11	904.988	22	927.289

9. DESCRIPTION

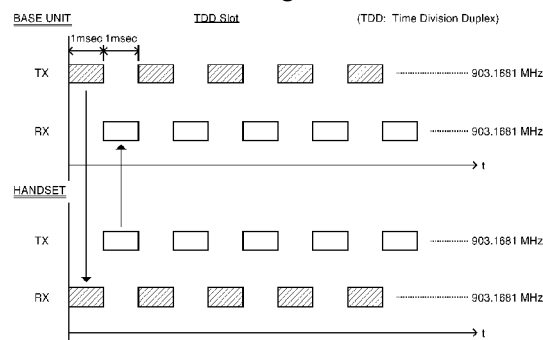
9.1. Frequency

The frequency range of 902.713 MHz ~ 927.289 MHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to the Frequency Table.

9.2. Time Division Duplex (TDD) operation

Transmission/reception between the base unit and handset is performed by time-sharing as shown in Fig. 7. 1 slot time of transmission and reception is 1mS. Same frequency is used in transmitting and receiving. The figure shows an example; the frequency of 3ch is used in transmitting between the base unit and handset.

Fig. 7

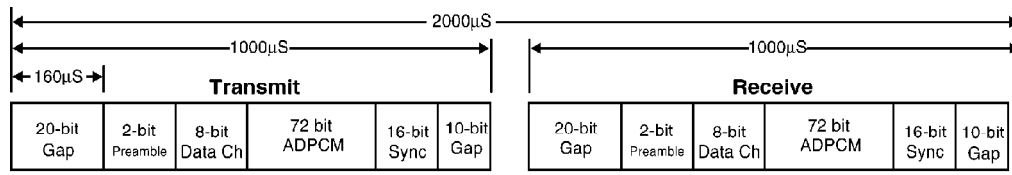


9.2.1. TDD Frame Format

The TDD frame is 2mS in length. Each subframe contains 128 bits of 7.8 μS duration.

Each subframe consists of the following four fields:

- A 2-bit Preamble field
- An 8-bit Data Channel field
- An 16-bit Sync Word
- A 72-bit ADPCM Payload (CRC 8-bit)



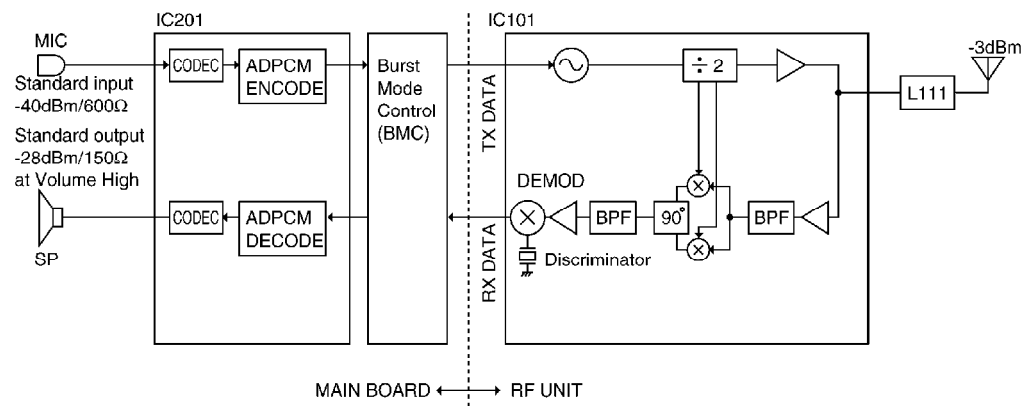
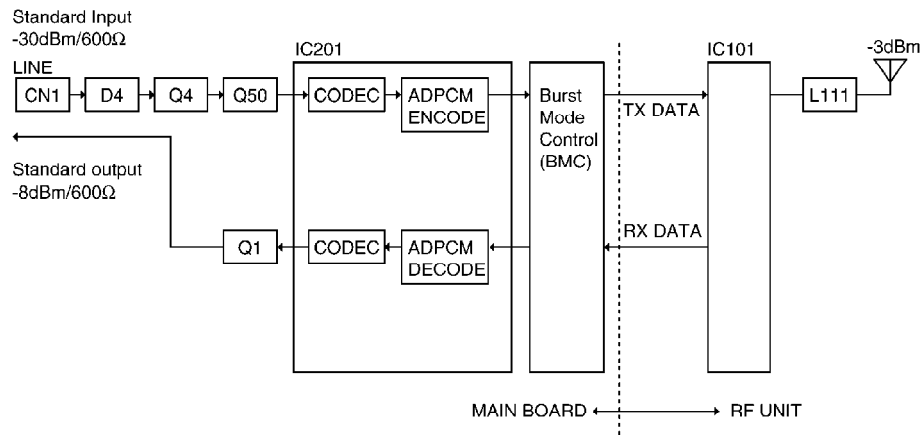
9.3. Signal Flowchart in the Whole System

Reception

CN1 of the base unit is connected to the TEL line, and the signal is input through the bridge diode D4. While talking the relay (Q4) is turned ON and amplified at the amplifiers Q50, then led to DSP (IC201). DSP generates ADPCM signal. The ADPCM signal is input to RFIC (IC101) of RF UNIT. RFIC outputs FSK modulated RF signal. The RF signal is passed through filter (L111) to be transmitted from the antenna. As for the handset, RF signal from the antenna is input to RFIC passing through filter (L111) then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal, then it is output to the speaker.

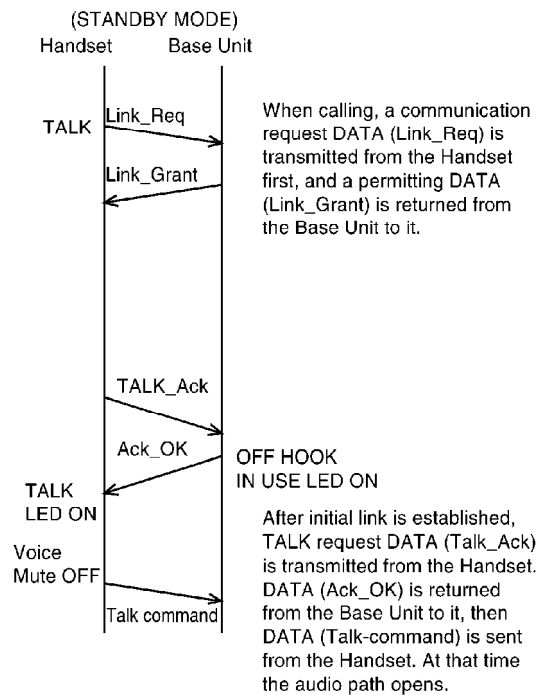
Transmission

The voice signal input from the microphone is led to DSP (IC201). The DSP generates ADPCM signal. As well as the reception, it is converted into the RF signal by RFIC (IC101). Passing through filter (L111), it is transmitted from the antenna. As for the base unit, RF signal from the antenna is input to RFIC (IC101) passing through filter (L111) and the balun then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal. The voice signal is amplified at the TX amplifier (Q1), then output to the TEL line (CN1) through the relay (Q4) and bridge (D4).

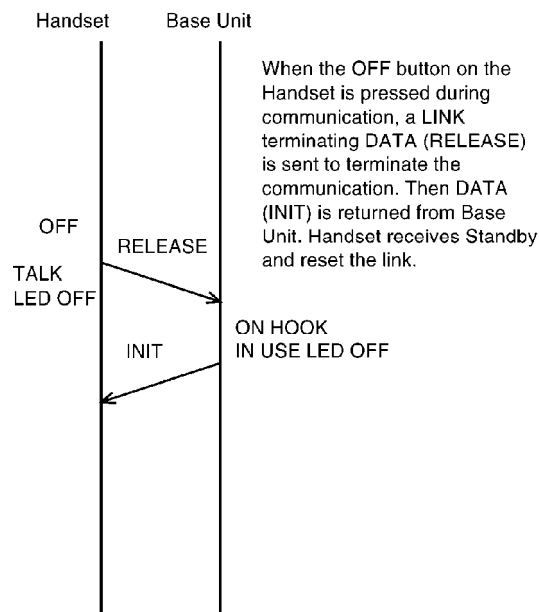


10. EXPLANATION OF BBIC (Base Band IC) DATA COMMUNICATION

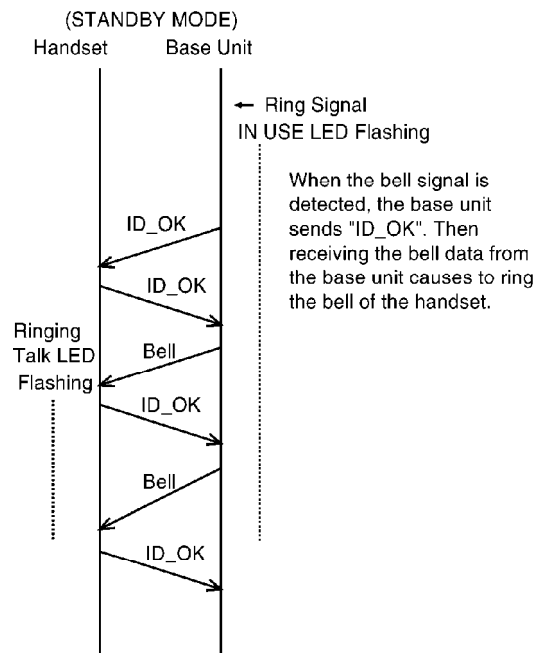
10.1. Calling



10.2. To Terminate Communication



10.3. Ringing



10.4. Ports for Transmitting and Receiving of Data

Handset: (IC201)
 Transmitting Pin 57 (TXO), Pin 64 (TXEN)
 Receiving Pin 66 (RXI), Pin 63 (RXEN)

Base Unit: (IC201)
 Transmitting Pin 57 (TXO), Pin 64 (TXEN)
 Receiving Pin 66 (RXI), Pin 63 (RXEN)

11. BLOCK DIAGRAM (Base Unit)

12. CIRCUIT OPERATION (Base Unit)

General Description:

(DSP, Flash Memory) is a digital speakerphone/speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.

The DSP system is fully controlled by a host processor DSP. The host processor provides activation and control of all that functions as follows.

12.1. DSP (Digital Speech/Signal Processing: IC201)

- Voice Message Recording/Play back

The DSP system use a proprietary speech compression technique to record and store voice message in FLASH MEMORY.

An error correction algorithm is used to enable playback of these messages from the FLASH MEMORY.

- DTMF Detection/Generator

The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Playback, and Line Monitoring modes of operation. When the DTMF data from the Handset is received, the DTMF signal is output.

- **Synthesized Voice (Pre-recorded message)**

The DSP implements synthesized Voice, utilizing the built in speech detector and an FLASH MEMORY, which stored the vocabulary.

- **Analog Switching**

The voice signal from telephone line is transmitted to the speaker or the voice signal from speakerphone microphone is transmitted to the Telephone line, etc. They are determined by the signal path route operation of voice signal.

- **Block Interface Circuit**

RF unit, LED, Key scan, Speaker, Microphone, Telephone line, LCD

12.2. Flash Memory (IC300)

Following information data is stored.

- **Voice signal**

ex: Pre-recorded Greeting message, Incoming message

- **Telephone number, etc.**

ex: Telephone Directory number, ID code

- **Settings**

ex: message numbers, pulse tone dial

12.3. Power Supply Circuit

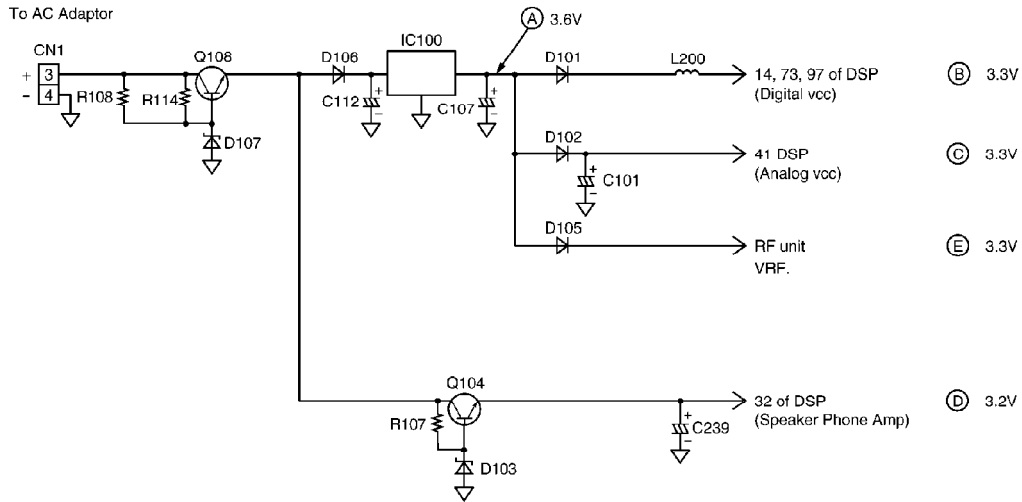
Function:

The power supply voltage from AC adaptor is converted to the desired voltage of each block.

Circuit Operation:

This unit supplies the voltage to each block as shown below.

Circuit Diagram



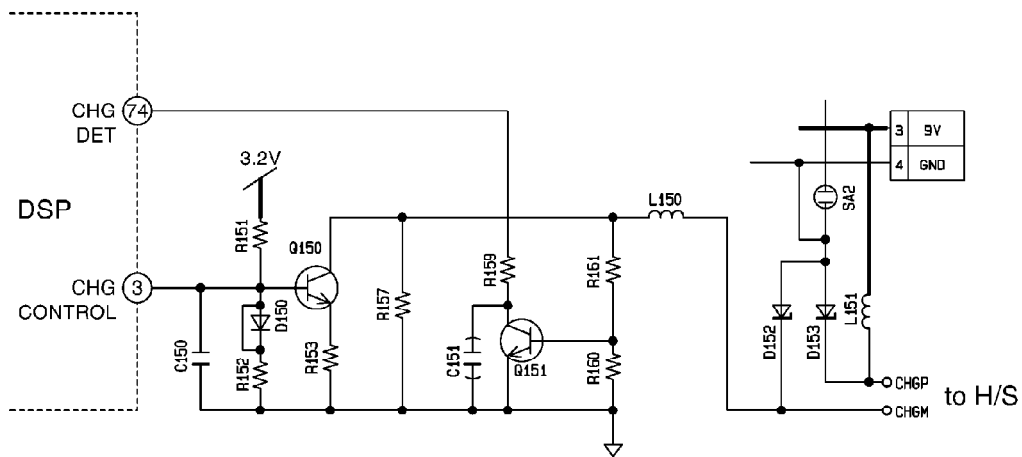
12.3.1. Charge Circuit

The voltage from the AC is supplied to the main charge circuits. Normal charge (70 mA) of maximum 20-hours is started soon after the Handset is placed on the base unit. Then it changes to trickle charge (15 mA on the average) to prevent from overcharging.

Normal charge: Q150 is ON

Trickle charge: Q150 is OFF

Circuit Diagram



12.4. Reset Circuit

Function:

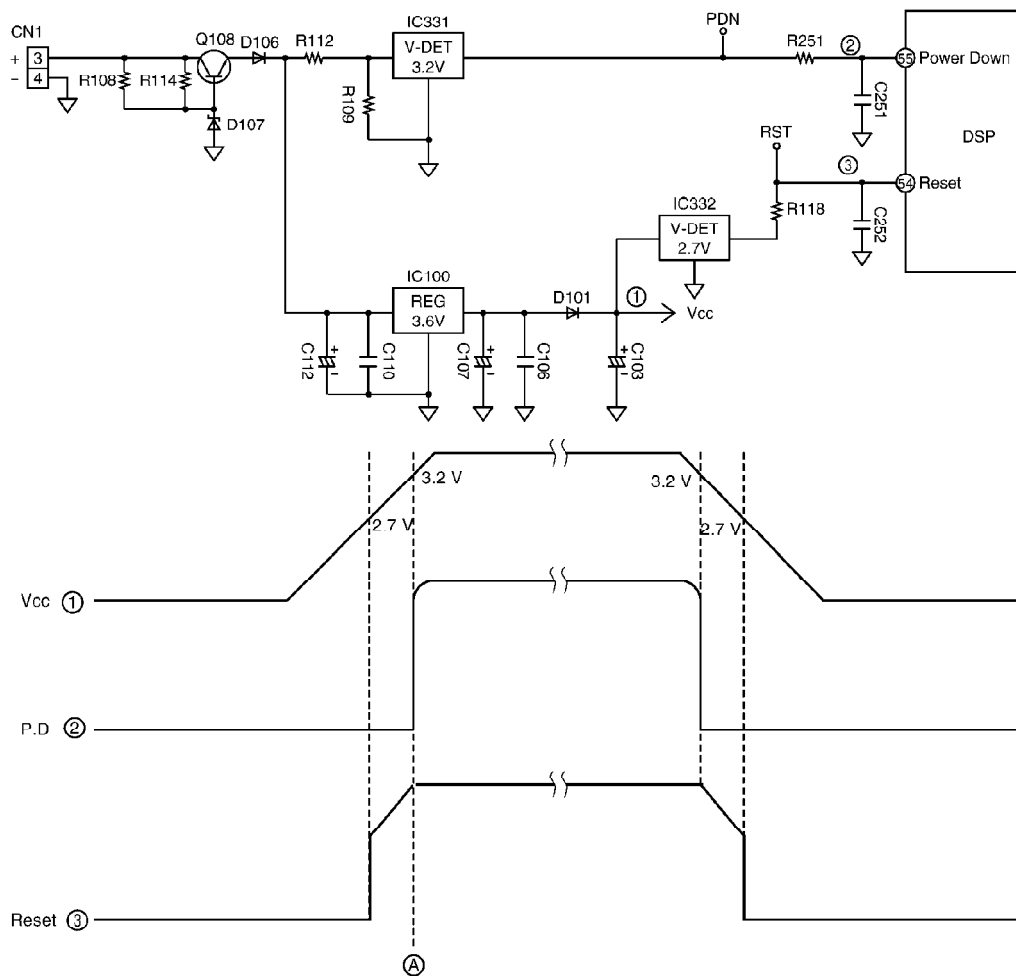
This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:

When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC100, D101 and power is supplied to the DSP.

The set can operate beyond point **A** in the circuit voltage diagram.

Circuit Diagram



12.5. Locator/Intercom Mode

1. When the base unit LOCATOR/INTERCOM button is pressed, a call monitor signal (intercom sound) is output from pins 29 and 31 of IC201. Thus a monitor tone is heard from the speaker.
2. At the same time, flashing of the IN USE/CHARGE (LED202) is obtained from pin 70 of IC201. This status is called "Intercom stand-by".
3. The receiving signal flows:
RF → pins 29 and 31 of IC201 → SP
4. The transmission signal flows:
MIC → C235, C236 → R213, R214 → pins 46 and 47 of IC201 → RF

12.6. Telephone Line Interface

Telephone Line Interface Circuit:

Function

- Bell signal detection
- ON/OFF hook and pulse dial circuit
- Side tone circuit
- Auto-disconnect circuit/Parallel connection detection circuit

Bell signal detection and OFF HOOK circuit:

In the idle mode, Q4 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

T → L1 → R30 → C16 → Q6 → DSP pin 27. [BELL]

When the CPU (DSP) detects a ring signal, and press the TALK key onto the handset. Q4 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the Loop current.

T → D4 → Q4 → R1/R2 → C1 → R3 → R5 → D1 → D4 → L2 → POS1 → R

ON HOOK Circuit:

Q4 is open, Q4 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

Pulse Dial Circuit:

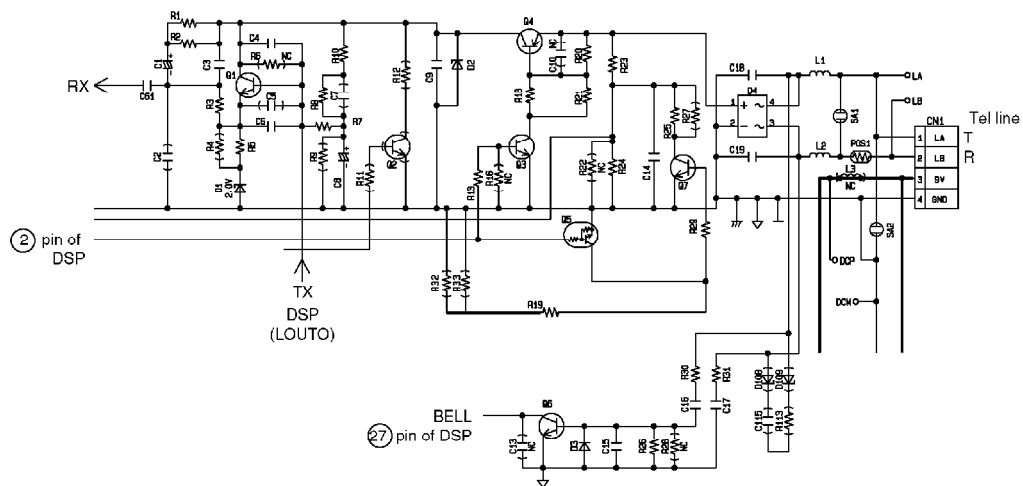
DSP (2) turns Q4 ON/OFF to make the pulse dialing.

Side Tone Circuit:

Basically this circuit prevents the TX signal from feeding back to RX signal.

As for this unit, TX signal feed back from Q1 is canceled by the chancellor circuit of DSP.

Circuit Diagram



12.7. Auto Disconnect Circuit

Function:

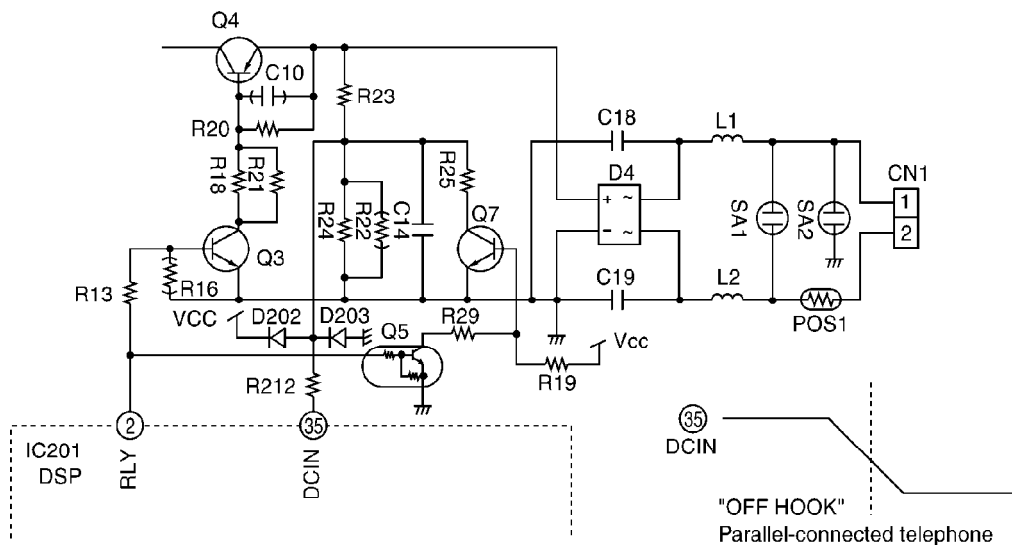
This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:

The voltage DCIN of DSP is monitored. If a parallel-connected telephone is put into an OFF HOOK status, the presence/absence of a parallel connection is determined when the voltage changes by 0.2V or more.

When the set detects the parallel-connected telephone is OFF HOOK status, the line is disconnected.

Circuit Diagram



12.8. Parallel Connection Detect Circuit

Function:

In order to disable call waiting and stutter tone functions when using telephones connected in parallel, it is necessary to have a circuit that judges whether a telephone connected in parallel is in use or not. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

Circuit Operation:

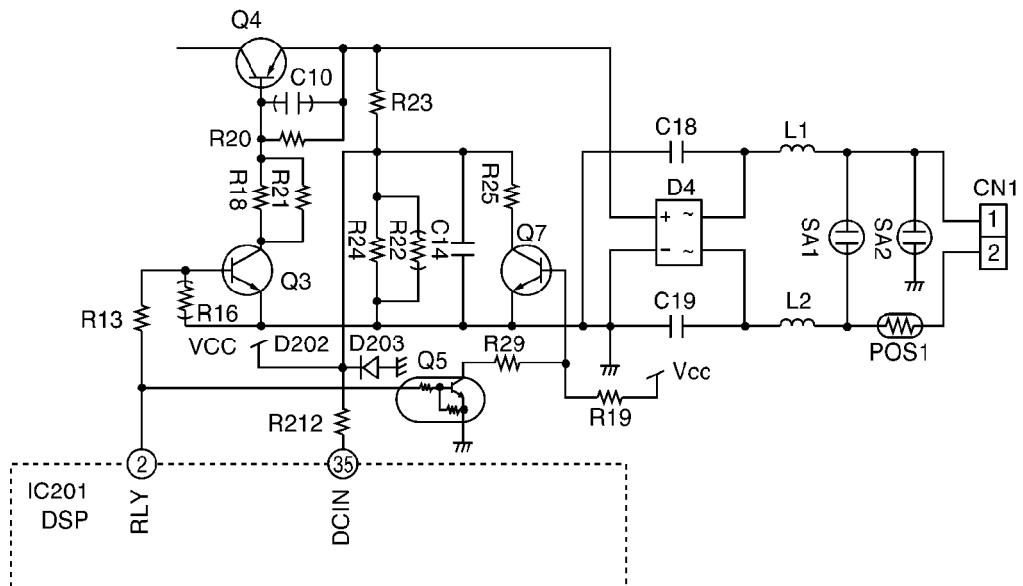
Parallel connection detection when on hook:

When on hook Q7 is ON, the voltage is monitored DCIN of DSP. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook Q7 is OFF, the voltage is monitored DCIN of DSP; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

Circuit Diagram

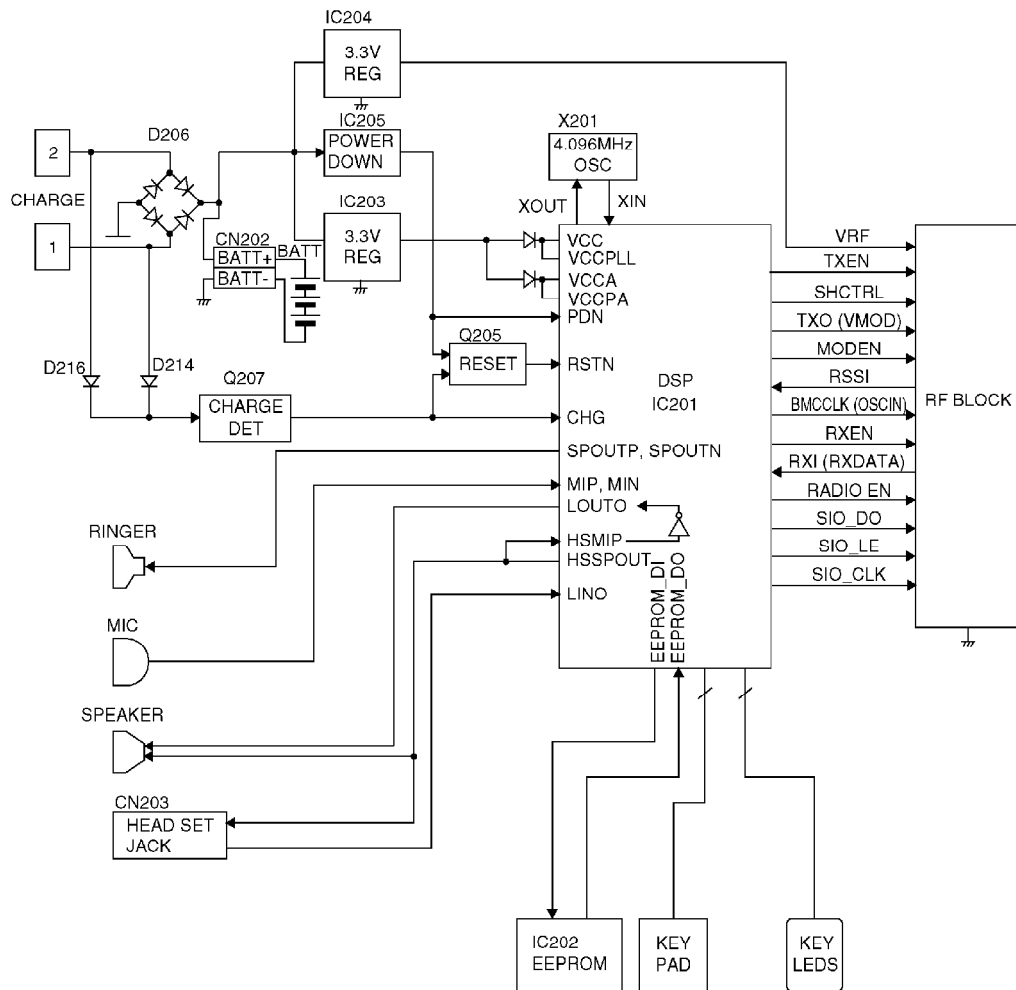


12.9. Signal Route

Each signal route is as follows.

SIGNAL ROUTE	IN → ROUTE → OUT
HANDSET Tx	HANDSET MIC → C232 - R231 → IC201 (46 - 47, 57) - RF unit (2) - - - RF unit (4) - C230 - R229 → IC201 (66, 34) - R223 - C244 - R222 - Q1 - Q4 - D4 - TEL LINE
HANDSET Rx	TEL LINE - L1 - D4 - Q4 - C3 - C61 - R57 - R55 - C58 - Q50 - C57 - C50 - R225 - C413 - IC201 (44, 57) - RF unit (2) - - - RF unit (4) - IC201 (66, 33 - 44) R302 → HANDSET SPEAKER C257 - Headset - C301 - R303 - L209
GREETING PLAY TO TEL LINE	IC201 (34) - R223 - C244 - R222 - Q1 - TEL LINE
ICM PLAY TO SPEAKER	IC201 (29 - 31) - Speaker
ICM RECORDING	TEL LINE - C3 - C61 - R57 - C58 - Q50 - C50 - R227 - C250 - IC201 (36)
GREETING RECORDING	MIC - C235, C236 - R213, R214 - IC201 (46 - 47)
DTMF DETECTION OGM OUTPUTTING /DTMF DETECTION ICM RECORDING	TEL LINE - L1 - D4 - Q4 - C3 - C61 - R57 - R55 - C58 - Q50 - C57 - C50 - R227 - C250 - IC201 (36)
DTMF SIGNAL TO TEL- LINE	IC201 (34) - R223 - C244 - R222 - Q1 - Q4 - D4 - L1 - TEL LINE

13. BLOCK DIAGRAM (Handset)



14. CIRCUIT OPERATION (Handset)

14.1. Construction

The circuit mainly consists of DSP and RF unit as shown in the block diagram.

14.1.1. DSP:IC201

Function

- Battery Low, Power down defect circuit
- Ringer Generation
- Interface circuit
- RF unit, speaker, mic, LED, Key scan, Headset

14.1.2. RF unit

Mainly voice signal is modulated to RF, or it goes the other way.

14.1.3. EEPROM: IC201

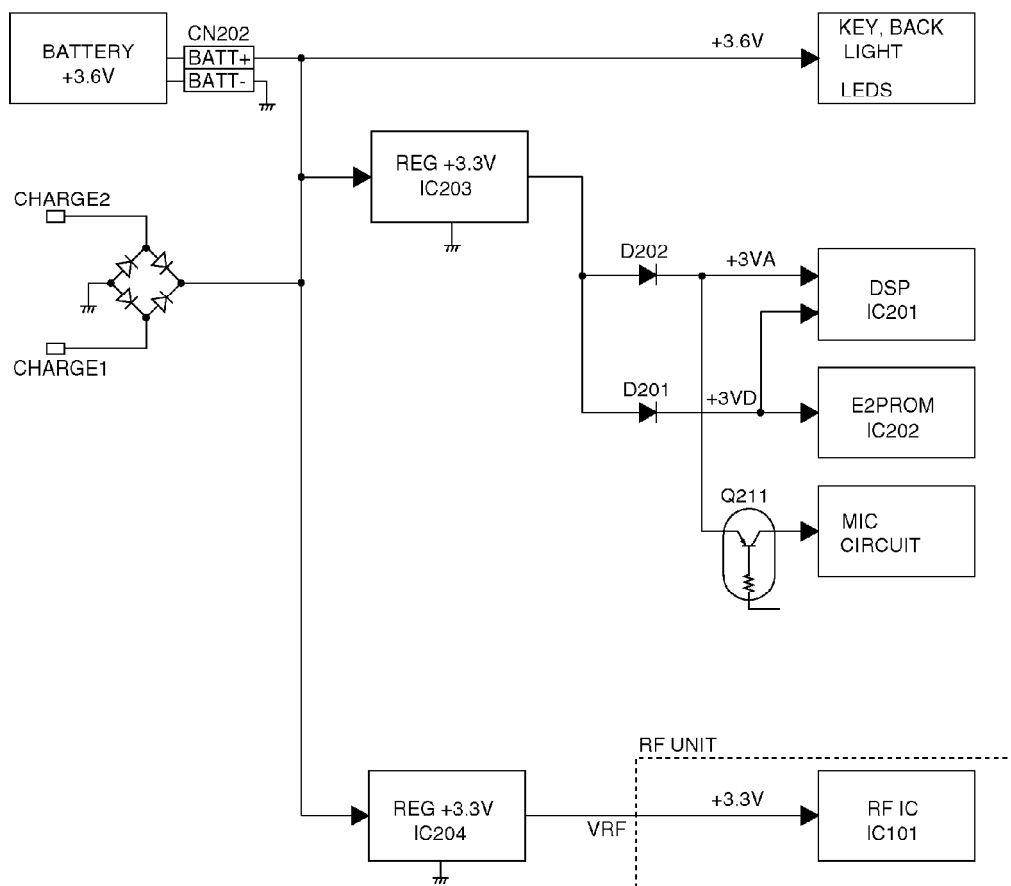
All setting data is stored.

ex: ID code, user setting (Flash Time, Tone/Pulse)

14.2. Power Supply Circuit

Voltage is supplied separately to each block as shown the Block Diagram below.

Block Diagram (Handset Power)



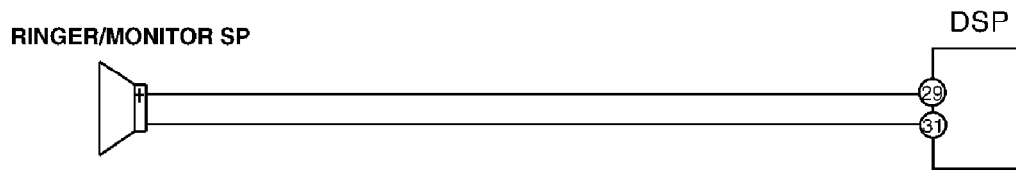
14.3. Charge Circuit

Ni-Cd battery is connected to CN202. When the handset is put on the cradle of the base unit, the power is supplied from CHARGE1 and CHARGE2 terminals to charge the battery. Q207 detects the voltage of CHARGE1 and CHARGE2 terminals, then the handset makes ID code setting with the base unit.

14.4. Ringer and Handset SP-Phone

DSP (29-31) → SP/RINGER

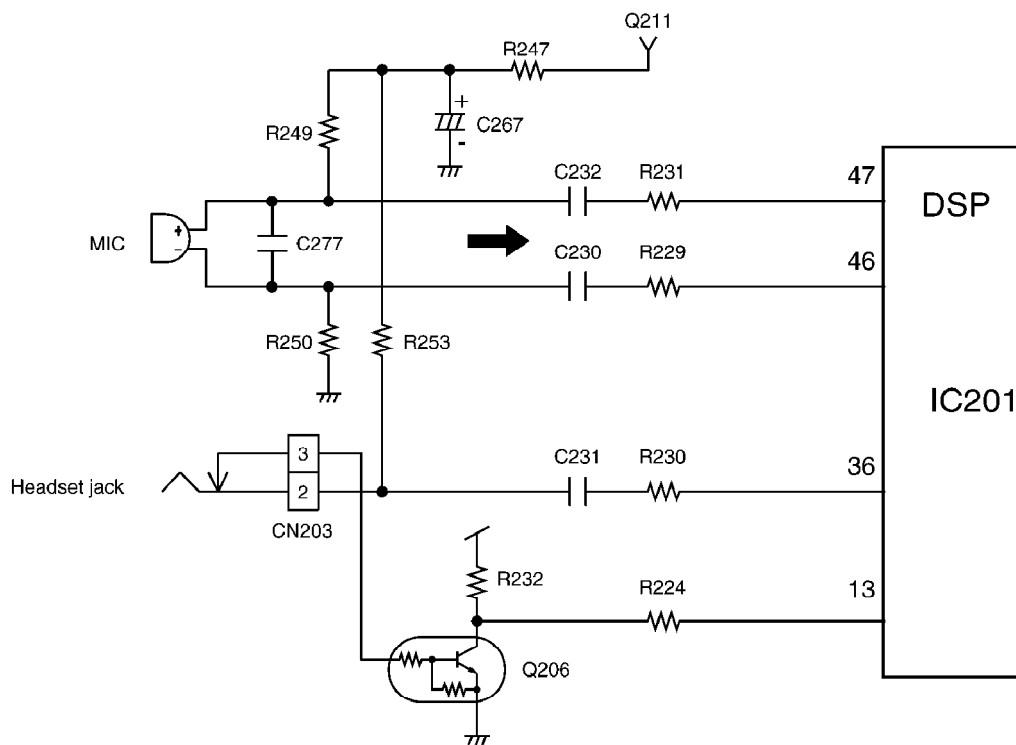
Circuit Diagram



14.5. Sending Signal

The voice signal from the microphone input to DSP (46-47). CN203 is the headset jack. When the headset is connected, the Q206 detect it. The input from the microphone of the handset (MIN, MIP) is cut and the microphone signal from the headphone is input to DSP (36). Also the power for the microphone is supplied from Q211, and the power is turned OFF on standby.

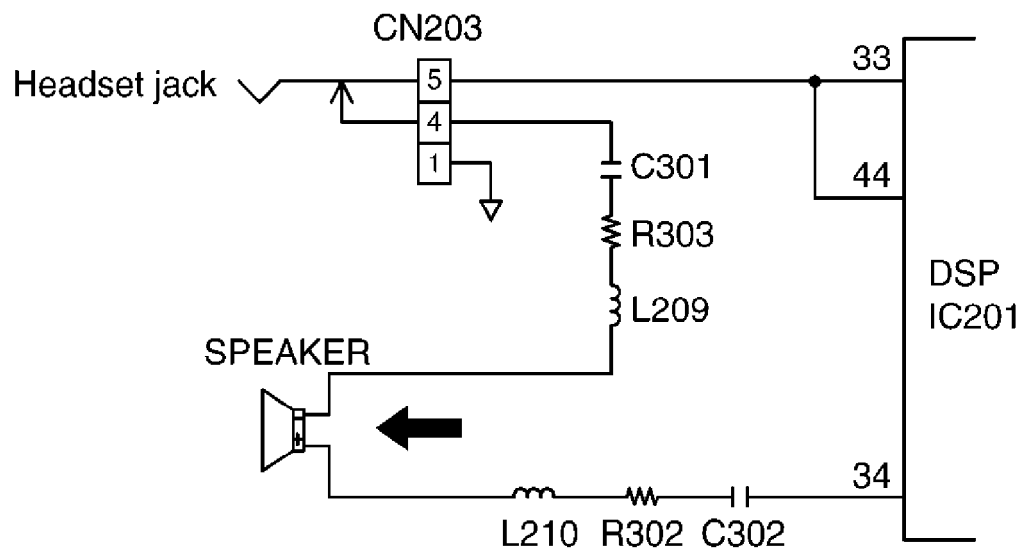
Circuit Diagram



14.6. Reception Signal

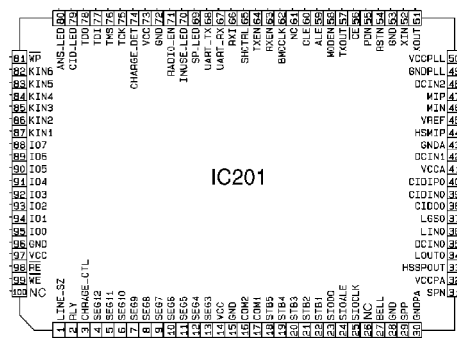
The voice signal from the base unit is output to DSP (33) (HSSOUT). This signal is led to the headset jack (CN203) and DSP (44) (HSMIP). The signal input to DSP (44) is inverted and output to DSP (34) (LOUTO). The signal through the headset jack is inverted, then output from DSP (34) to drive the speaker. When the headset is inserted to the jack, the voice signal is cut at the jack, so the sound does not come out from the speaker, but from the headset only.

Circuit Diagram



15. CPU DATA (Base Unit)

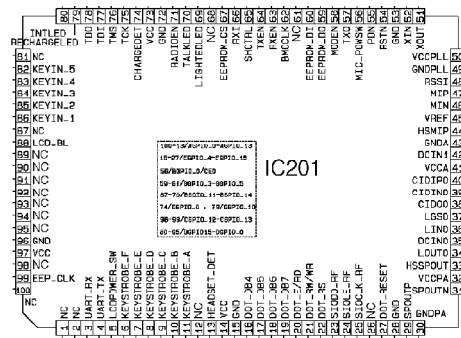
15.1. IC201



Pin	Description	I/O	High	High_Z	Low	Pin	Description	I/O	High	High_Z	Low
1	LINE_SZ	D.O	On	-	Off	51	XOUT	A.O	-	-	-
2	RLY	D.O	On	-	Off	52	XIN	A.I	-	-	-
3	CHAGEG_CTL	D.O	-	Charge	Non Charge	53	GND	GND	-	-	GND
4	SEG 12	D.O	High	-	Low	54	RSTN	D.I	Normal	-	Reset
5	SEG 11	D.O	High	-	Low	55	PDN	D.I	Power On	-	Power Down
6	SEG 10	D.O	High	-	Low	56	CE	D.O	Not	-	Active
7	SEG 9	D.O	High	-	Low	57	TXOUT	D.O	-	-	-
8	SEG 8	D.O	High	-	Low	58	MODEN	D.I	-	-	-
9	SEG 7	D.O	High	-	Low	59	ALE	D.O	Latch	-	Not
10	SEG 6	D.O	High	-	Low	60	CLE	D.O	Latch	-	Not
11	SEG 5	D.O	High	-	Low	61	NC	D.O	-	-	Normal
12	SEG 4	D.O	High	-	Low	62	BMCCLK	D.O	-	-	-
13	SEG 3	D.O	High	-	Low	63	RXEN	D.O	-	-	-
14	VCC	VCC	Vcc	-	-	64	TXEN	D.O	-	-	-
15	GND	GND	-	-	GND	65	SHC CTRL	D.O	-	-	-
16	COM2	D.O	High	Middle	Low	66	RXI	D.I	-	-	-
17	COM1	D.O	High	Middle	Low	67	UART_RX	D.I	High	-	Low
18	STB5	D.O	Active	Not	-	68	UART_TX	D.O	High	-	Low
19	STB4	D.O	Active	Not	-	69	SP_LED	D.O	-	Off	On
20	STB3	D.O	Active	Not	-	70	INUSE_LED	D.O	-	Off	On
21	STB2	D.O	Active	Not	-	71	RADIO_EN	D.O	-	-	-
22	STB1	D.O	Active	Not	-	72	GND	GND	-	-	GND
23	SIO DO	D.O	High	-	Low	73	VCC	VCC	VCC	-	-
24	SIO ALE	D.O	Latch	-	Not	74	CHARGE_DET	D.I	Off Charge	-	On Charge
25	SIO CLK	D.O	High	-	Low	75	TCK	D.O	-	-	-
26	NC	D.O	-	-	Normal	76	TMS	D.O	-	-	-
27	BELL	D.I	Off	-	On	77	TDI	D.I	-	-	-
28	GND	GND	-	-	GND	78	TDO	D.O	-	-	-
29	SPP	A.O	-	-	-	79	CID_LED	D.O	-	Off	On
30	GNDPA	GND	-	-	GND	80	ANS_LED	D.O	-	Off	On
31	SPN	A.O	-	-	-	81	WP	D.O	Off	-	On
32	VCCPA	VCC	VCC	-	-	82	KIN6	D.I	Key In	-	Non
33	HSSPOUT	A.O	-	-	-	83	KIN5	D.I	Key In	-	Non
34	LOUTO	A.O	-	-	-	84	KIN4	D.I	Key In	-	Non
35	DCIN0	A.I	-	-	-	85	KIN3	D.I	Key In	-	Non
36	LINO	A.I	-	-	-	86	KIN2	D.I	Key In	-	Non
37	LGSO	A.I	-	-	-	87	KIN1	D.I	Key In	-	Non
38	CIDOO	A.I	-	-	-	88	IO7	D.O	High	-	Low
39	CIDINO	A.I	-	-	-	89	IO6	D.O	High	-	Low
40	CIDIPO	A.I	-	-	-	90	IO5	D.O	High	-	Low
41	VCCA	VCC	VCC	-	-	91	IO4	D.O	High	-	Low
42	DCIN1	A.I	-	-	-	92	IO3	D.O	High	-	Low
43	GNDA	GND	-	-	GND	93	IO2	D.O	High	-	Low
44	HSMIP	A.I	-	-	-	94	IO1	D.O	High	-	Low
45	VREF	A.O	-	-	-	95	IO0	D.O	High	-	Low
46	MIN	A.I	-	-	-	96	GND	GND	-	-	GND
47	MIP	A.I	-	-	-	97	VCC	VCC	VCC	-	-
48	DCIN2	A.I	-	-	-	98	RE	D.O	Active	-	Not
49	GNDPLL	GND	-	-	GND	99	WE	D.O	Active	-	Not
50	VCCPLL	VCC	VCC	-	-	100	NC	D.O	-	-	Normal

16. CPU DATA (Handset)

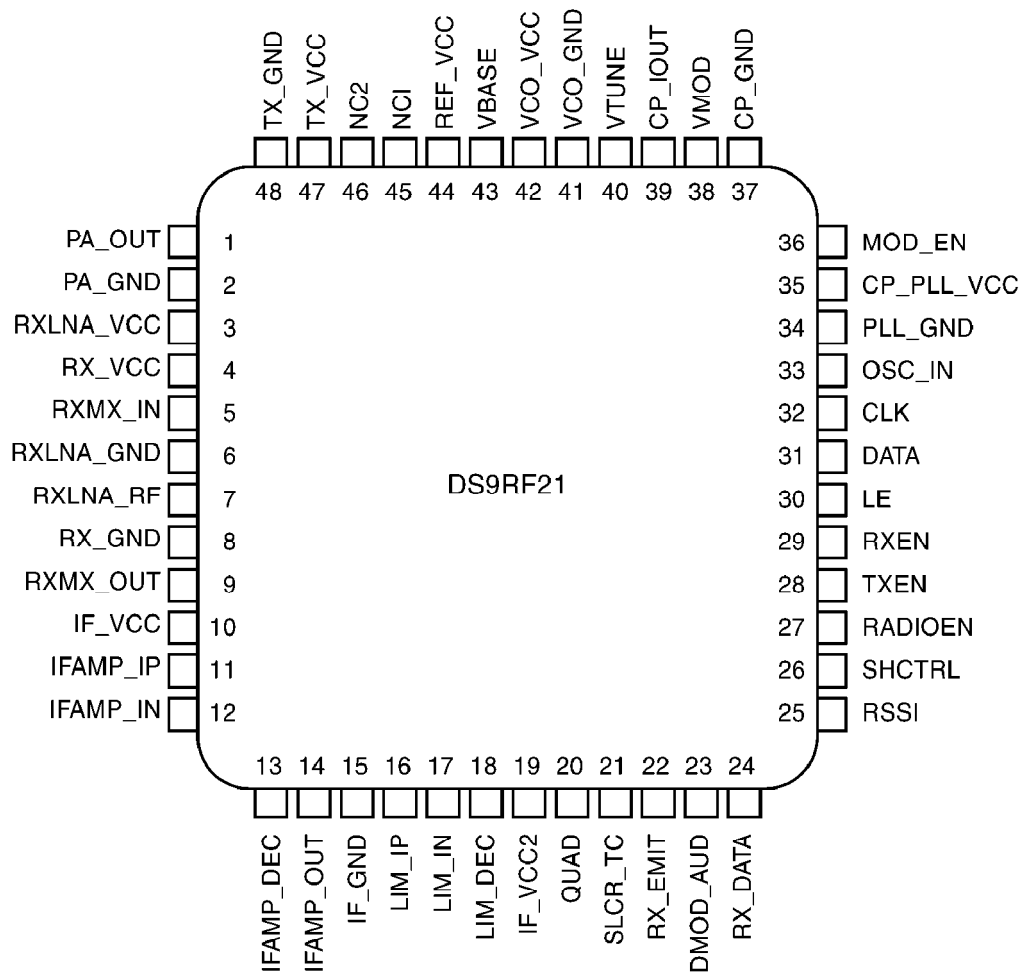
16.1. IC201



Pin	Description	I/O	High	High_Z	Low	Pin	Description	I/O	High	High_Z	Low
1	NC	D.O	-	-	Normal	51	XOUT	A.O	-	-	-
2	NC	D.O	-	-	Normal	52	XIN	A.I	-	-	-
3	UART_RX	D.I	High	-	Low	53	GND	GND	-	-	GND
4	UART_TX	D.O	High	-	Low	54	RSTN	D.I	Normal	-	Reset
5	LCDPower_SW	D.O	Normal	-	-	55	PDN	D.I	Power On	-	Power Down
6	KEYSTROBE_F	D.O	-	Not	Active	56	MIC_POWSW	D.O	Bias Off	-	Bias On
7	KEYSTROBE_E	D.O	-	Not	Active	57	TXO	D.O	-	-	-
8	KEYSTROBE_D	D.O	-	Not	Active	58	MODEN	D.O	-	-	-
9	KEYSTROBE_C	D.O	-	Not	Active	59	EEPROM_DO	D.I	High	-	Low
10	KEYSTROBE_B	D.O	-	Not	Active	60	EEPROM_DI	D.O	High	-	Low
11	KEYSTROBE_A	D.O	-	Not	Active	61	NC	D.O	-	-	Normal
12	NC	D.O	-	-	Normal	62	BMCLK	D.O	-	-	-
13	HEADSET_DET	D.I	Headset In	-	Non	63	RXEN	D.O	-	-	-
14	VCC	VCC	Vcc	-	-	64	TXEN	D.O	-	-	-
15	GND	GND	-	-	GND	65	SHCTRL	D.O	-	-	-
16	DOT_DB4	D.O	-	-	Normal	66	RXI	D.I	-	-	-
17	DOT_DB5	D.O	-	-	Normal	67	EEPROM_CS	D.O	Active	-	Not
18	DOT_DB6	D.O	-	-	Normal	68	NC	D.O	-	-	Normal
19	DOT_DB7	D.O	-	-	Normal	69	LITEDLED	D.O	On	-	Off
20	DOT_E/RD	D.O	-	-	Normal	70	TALK LED	D.O	Off	-	On
21	DOT_RWWR	D.O	-	-	Normal	71	RADIOEN	D.O	-	-	-
22	DOT_RS	D.O	-	-	Normal	72	GND	GND	-	-	GND
23	SIO DO_RF	D.O	High	-	Low	73	VCC	VCC	VCC	-	-
24	SIO LE_RF	D.O	Latch	-	Not	74	CHARGEDET	D.I	Off Charge	-	On Charge
25	SIO CLK_RF	D.O	High	-	Low	75	TCK	D.O	-	-	-
26	NC	D.O	-	-	Normal	76	TMS	D.O	-	-	-
27	DOT_RESET	D.O	-	-	Normal	77	TDI	D.I	-	-	-
28	GND	GND	-	-	GND	78	TDO	D.O	-	-	-
29	SPOUTP	A.O	-	-	-	79	RECHAGELED	D.O	Off	-	On
30	GNDPA	GND	-	-	GND	80	INTLED	D.O	Off	-	On
31	SPOUTN	A.O	-	-	-	81	NC	D.O	Normal	-	-
32	VCCPA	VCC	VCC	-	-	82	KEYIN_5	D.I	Non	-	Key In
33	HSSPOUT	A.O	-	-	-	83	KEYIN_4	D.I	Non	-	Key In
34	LOUTO	A.O	-	-	-	84	KEYIN_3	D.I	Non	-	Key In
35	DCINO	A.I	-	-	-	85	KEYIN_2	D.I	Non	-	Key In
36	LINO	A.I	-	-	-	86	KEYIN_1	D.I	Non	-	Key In
37	LGSO	A.I	-	-	-	87	NC	D.O	Normal	-	-
38	CIDOO	A.I	-	-	-	88	LCD_BL	D.O	-	-	Normal
39	CIDINO	A.I	-	-	-	89	NC	D.O	-	-	Normal
40	CIDIPO	A.I	-	-	-	90	NC	D.O	-	-	Normal
41	VCCA	VCC	VCC	-	-	91	NC	D.O	-	-	Normal
42	DCIN1	A.I	-	-	-	92	NC	D.O	-	-	Normal
43	GNDA	GND	-	-	GND	93	NC	D.O	-	-	Normal
44	HSMIP	A.I	-	-	-	94	NC	D.O	-	-	Normal
45	VRFF	A.O	-	-	-	95	NC	D.O	-	-	Normal
46	MIN	A.I	-	-	-	96	GND	GND	-	-	GND
47	MIP	A.I	-	-	-	97	VCC	VCC	VCC	-	-
48	RSSI	A.I	-	-	-	98	NC	D.O	-	-	Normal
49	GNDPLL	GND	-	-	GND	99	EPP_CLK	D.O	High	-	Low
50	VCCPLL	VCC	VCC	-	-	100	NC	D.O	-	-	Normal

17. EXPLANATION OF IC TERMINALS (RF Unit)

17.1. IC101



Pin	Description	I/O
1	PA_OUT	O
2	PA_GND	O
3	RXLNA_VCC	O&VCC
4	RX_VCC	VCC
5	RXXMX_IN	I
6	RXLNA_GND	GND
7	RXLNA_RF	I
8	RX_GND	GND
9	RXXMX_OUT	O&VCC
10	IF_VCC	VCC
11	IFAMP_IP	I
12	IFAMP_IN	I
13	IFAMP_DEC	I
14	IFAMP_OUT	O
15	IF_GND	GND
16	LIM_IP	I
17	LIM_IN	I
18	LIM_DEC	I
19	IF_VCC2	VCC
20	QUAD	I
21	SLCR_TC	I

Pin	Description	I/O
25	RSSI	O
26	SHCTRL	I
27	RADIOEN	I
28	TXEN	I
29	RXEN	I
30	LE	I
31	DATA	I
32	CLK	I
33	OSC_IN	I
34	PLL_GND	GND
35	CP_PLL_VCC	VCC
36	MOD_EN	I
37	CP_GND	GND
38	VMOD	I
39	CP_IOUT	O
40	VTUNE	I
41	VCO_GND	GND
42	VCO_VCC	VCC
43	VBASE	I
44	REF_VCC	VCC
45	NCI	N/C

22	RX_EMIT	GND	46	NC2	N/C
23	DMOD_AUD	O	47	TX_VCC	VCC
24	RX_DATA	O	48	TX_GND	GND

18. HOW TO REPLACE FLAT PACKAGE IC

18.1. Preparation

- SOLDER

Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

Recommended power consumption will be between 30 W to 40 W.

Temperature of Copper Rod $662 \pm 50^{\circ}\text{F}$ ($350 \pm 10^{\circ}\text{C}$)

(An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

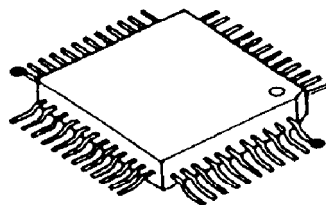
- Flux

HI115 Specific gravity 0.863.

(Original flux will be replaced daily.)

18.2. Procedure

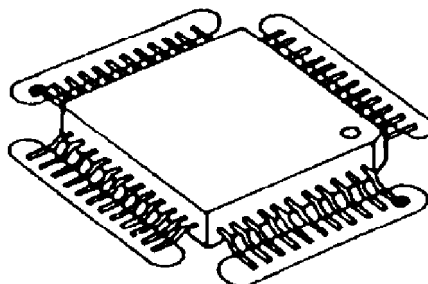
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.



● - - - - - Temporary soldering point.

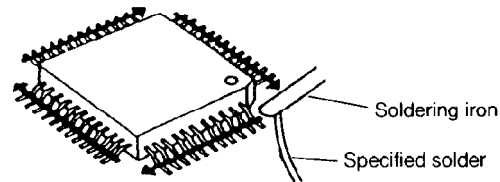
*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.



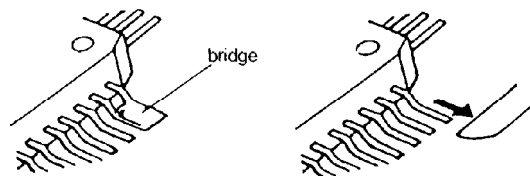
○ - - - - - Flux

3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.

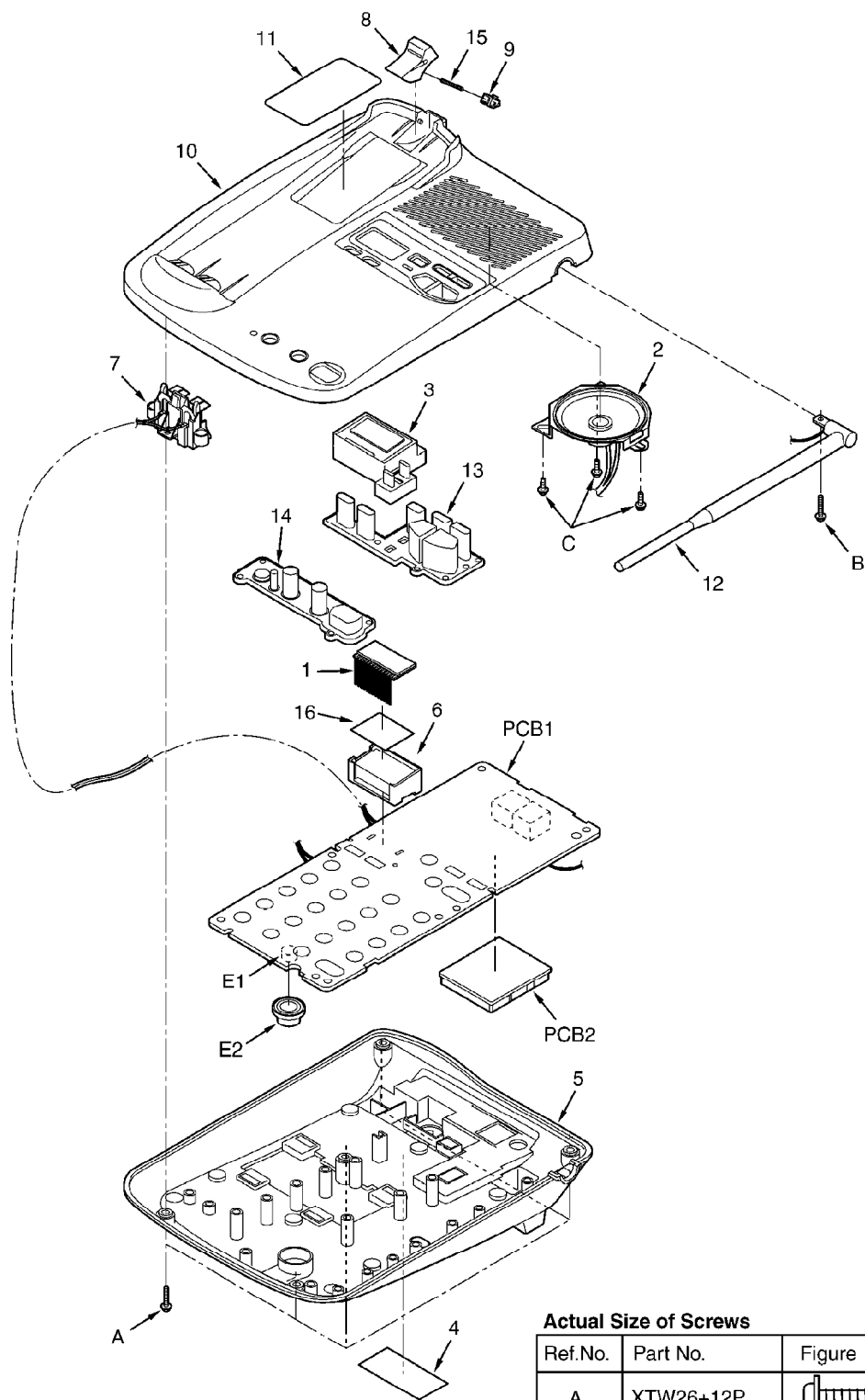


18.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.



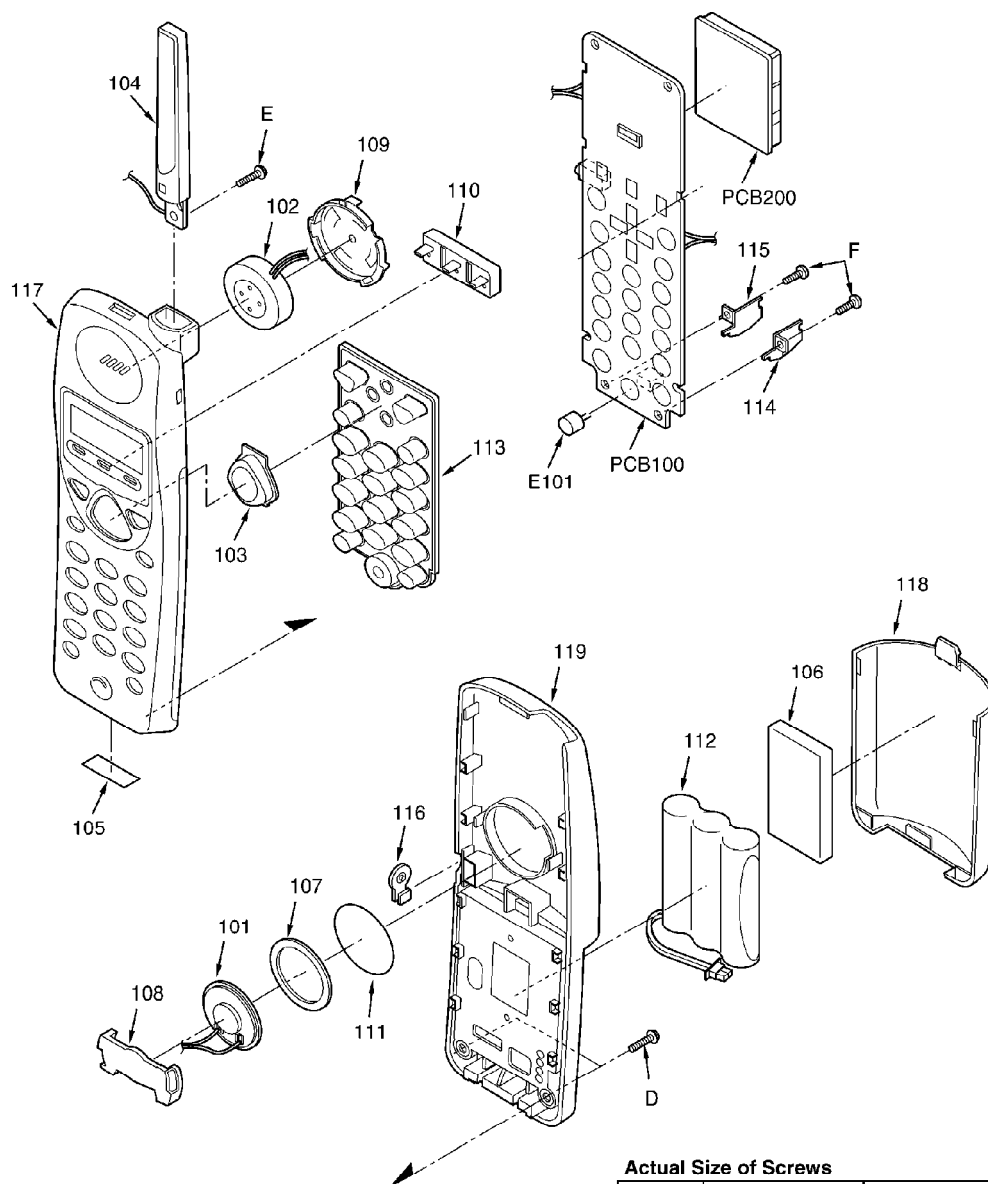
19. CABINET AND ELECTRICAL PARTS (Base Unit)



Actual Size of Screws

Ref.No.	Part No.	Figure
A	XTW26+12P	
B	XTW26+12P	
C	XTW3+S8P	

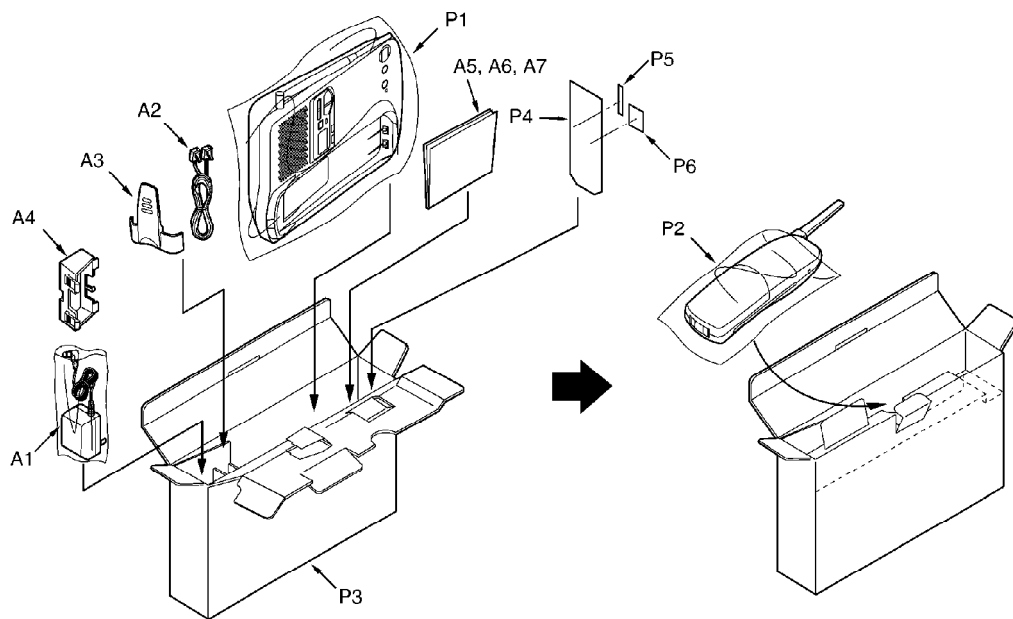
20. CABINET AND ELECTRICAL PARTS (Handset)



Actual Size of Screws

Ref.No.	Part No.	Figure
D	XTW26+12P	
E	XTW26+12P	
F	XTW26+10J	

21. ACCESSORIES AND PACKING MATERIALS

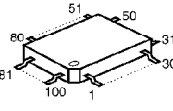
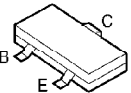
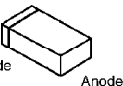
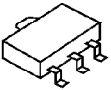
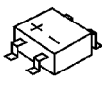


22. TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

22.1. Base Unit

 Anode Cathode PQVDR LZ2R0 PQVDR LZ20A	 C2HBBG000011	 2SD1994A	 2SD1758Q	 UN5213 2SD1819A C0EBE0000142
 E C B 2SC2120 2SA1625 PQVT2N6517CA	 E C B 2SD2136	 PQVDS1ZB60F1	 Cathode Anode MA111 MA8039 MA8068M PQVDHRU0302A	
 PQWITC1503BH	 C0CBABD00013	 PQVIPS3432UT	 Cathode Anode PQVDEL1921SR PQVDSML310MT	

22.2. Handset

 C2HBBG000014	 2SD1819A PQVTDTC143E PQVDTA143TU		 MA111 MA8100M MA2ZD1400	Cathode  Anode PQVDEL1921SR PQVDSML310MT
 PQWITC1503BR	 PQVIC62FP33M	 C0CBABD00011	 PQVDS1ZB60F1	 PQVIC61CN32N

23. REPLACEMENT PARTS LIST

This replacement parts list are U.S.A. version only.

Note:

1. RTL (Retention Time Limited)

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.

After the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by a  mark special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) P= μ μ F

*Type & Wattage of Resistor

Type					
ERC:Solid		ERX:Metal Film		PQ4R:Carbon	
ERD:Carbon		ERG:Metal Oxide		ERS:Fusible Resistor	
PQRD:Carbon		ER0:Metal Film		ERF:Cement Resistor	
Wattege					
10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W
*Type & Voltage of Capacitor					
Type					
ECFD:Semi-Conductor		ECCD,ECKD,ECBT,PQCB: Ceramic			
ECQS:Styrol		ECQE,ECQV,ECQG: Polyester			
PQCUV:Chip		ECEA,ECSZ:Electlytic			
ECQMS:Mica		ECQP:Polypropylene			
Voltage					
ECQ Type	ECQG ECQV Type	ECSZ Type	Others		
1H:50V	05:50V	0F:3.15V	0J :6.3V	1V :35V	
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V	
2E:250V	2:200V	1V:35V	1C :16V	1J :63V	
2H:500V		0J:6.3V	1E,25:25V	2A :100V	

23.1. Base Unit

23.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
<u>1</u>	L5DCBCB00004	LIQUID CRYSTAL DISPLAY	
<u>2</u>	PQAS57P03Y	SPEAKER	
<u>3</u>	PQGP10182Y1	LCD PANEL	S
<u>4</u>	PQGT14615Z	NAME LABEL	
<u>5</u>	PQYF10199Z1	LOWER CABINET (for KX-TC1503B)	S
5	PQKF10522Z2	LOWER CABINET (for KX-TC1503W)	S
<u>6</u>	PQHR10854Z	LCD HOLDER	
<u>7</u>	PQWE10022Z	CHARGE TERMINAL	
<u>8</u>	PQKE10131Z1	HOOK LEVER (for KX-TC1503B)	S
8	PQKE10131Z2	HOOK LEVER (for KX-TC1503W)	S
<u>9</u>	PQKE10134Z1	HOOK KNOB (for KX-TC1503B)	S
9	PQKE10134Z2	HOOK KNOB (for KX-TC1503W)	S
<u>10</u>	PQKM10494Z1	UPPER CABINET (for KX-TC1503B)	S
10	1AKM10494Z2	UPPER CABINET (for KX-TC1503W)	S
<u>11</u>	PQQT22304Z	TAM LABEL	
<u>12</u>	PQSA10095Z	ANTENNA (for KX-TC1503B)	
12	PQSA10095Y	ANTENNA (for KX-TC1503W)	
<u>13</u>	PQSX10173Z	TAM KEY RUBER SWITCH (for KX-TC1503B)	
13	PQSX10173Y	TAM KEY RUBER SWITCH (for KX-TC1503W)	
<u>14</u>	PQSX10179Z	FUNCTION KEY RUBBER SWITCH (for KX-TC1503B)	
14	PQSX10179Y	FUNCTION KEY RUBBER SWITCH (for KX-TC1503W)	
<u>15</u>	PQUS10285Z	HOOK SPRING	
<u>16</u>	PQHS10327Z	LCD TAPE	

23.1.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPTC1503BH	MAIN P.C.BAORD ASS'Y (RTL)	
		(ICS)	
IC100	C0CBABD00013	IC	
IC201	C2HBBG000011	IC	
IC300	PQWITC1503BH	IC	
IC331	PQVIPS3432UT	IC	S
IC332	C0EBE0000142	IC	
		(TRANSISTORS)	
Q1	2SC2120	TRANSISTOR(SI)	S
Q3	PQVT2N6517CA	TRANSISTOR(SI)	S
Q4	2SA1625	TRANSISTOR(SI)	S
Q5	UN5213	TRANSISTOR(SI)	S
Q6	2SD1819A	TRANSISTOR(SI)	
Q7	2SD1819A	TRANSISTOR(SI)	
Q50	2SD1819A	TRANSISTOR(SI)	
Q102	2SD1819A	TRANSISTOR(SI)	
Q104	2SD1758Q	TRANSISTOR(SI)	S
Q108	2SD2136	TRANSISTOR(SI)	
Q150	2SD1994A	TRANSISTOR(SI)	
Q151	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D1	PQVDRLZ2R0	DIODE(SI)	S
D2	PQVDRLZ20A	DIODE(SI)	S
D3	MA111	DIODE(SI)	
D4	PQVDS1ZB60F1	DIODE(SI)	
D101	PQVDHRU0302A	DIODE(SI)	S
D102	PQVDHRU0302A	DIODE(SI)	S
D103	MA8039	DIODE(SI)	
D105	PQVDHRU0302A	DIODE(SI)	S
D106	PQVDHRU0302A	DIODE(SI)	S
D107	MA8068M	DIODE(SI)	
D152	PQVDRLZ20A	DIODE(SI)	S
D153	PQVDRLZ20A	DIODE(SI)	S
D202	MA111	DIODE(SI)	
D203	MA111	DIODE(SI)	
		(LEDS)	
LED202	PQVDSML310MT	LED	S
LED203	PQVDEL1921SR	LED	
		(COILS)	
L1	PQLQXF330K	COIL	S
L2	PQLQXF330K	COIL	S
L150	PQLQZK3R3K	COIL	S
L151	PQLQXF330K	COIL	S
L200	PQLQR2KA213	COIL	S
L201	PQLQR4RB601D	COIL	
		(SURGE ABSORBERS)	
SA1	PQVDDSS301L	SURGE ABSORBER	S
SA2	PQVDDSS301L	SURGE ABSORBER	S
		(OTHERS)	
CN1	PQJJ2H003Z	JACK SOCKET	S
E1	PQJM147Y	MICROPHONE	
E2	PQMG10023Z	CUSHION RUBBER, MIC	
G401	PQJT10152Z	CHARGE TERMINAL	
G402	PQJT10152Z	CHARGE TERMINAL	

Ref. No.	Part No.	Part Name & Description	Remarks
G403	PQJT10152Z	CHARGE TERMINAL	
G404	PQJT10152Z	CHARGE TERMINAL	
G405	PQJT10152Z	CHARGE TERMINAL	
G406	PQJT10152Z	CHARGE TERMINAL	
POS1	PQRPAR390N	POSISTOR	S
RA200	EXRV8V104JV	RESISTOR ARRAY	S
X200	H0D409400014	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R1	ERJ3GEYJ122	1.2k	
R2	ERJ3GEYJ681	680	
R3	ERJ3GEYJ470	47	
R5	ERDS1TJ330	33	S
R7	ERJ3GEYJ393	39k	
R8	ERJ3GEY0R00	0	
R10	ERJ3GEYJ102	1k	
R13	ERJ3GEYJ473	47k	
R17	ERJ3GEYJ473	47k	
R18	ERJ3GEYJ103	10k	
R19	ERJ3GEYJ563	56k	
R20	ERD25TJ104	100k	S
R21	ERJ3GEYJ103	10k	
R23	ERDS1VJ106	10M	
R24	ERJ3GEYJ275	2.7M	
R25	ERJ3GEYJ155	1.5M	
R26	ERJ3GEYJ472	4.7k	
R29	ERJ3GEYJ472	4.7k	
R30	ERJ3GEYJ104	100k	
R31	ERJ3GEYJ104	100k	
R50	ERJ3GEYJ102	1k	
R51	ERJ3GEYJ470	47	
R52	ERJ3GEYJ394	390k	
R55	ERJ3GEYJ102	1k	
R57	ERJ3GEY0R00	0	
R70	ERJ3GEYJ392	3.9k	
R102	ERJ3GEYJ224	220k	
R104	ERJ3GEYJ473	47k	
R105	ERJ3GEYJ103	10k	
R107	ERJ3GEYJ331	330	
R109	ERJ3GEYJ683	68k	
R112	ERJ3GEYJ273	27k	
R114	ERDS1TJ181	180	S
R116	ERJ3GEY0R00	0	
R117	ERJ3GEY0R00	0	
R118	ERJ3GEYJ102	1k	
R150	ERJ3GEYJ104	100k	
R151	ERJ3GEYJ561	560	
R152	ERJ3GEYJ331	330	
R153	ERDS1TJ100	10	S
R157	ERDS1TJ391	390	S
R159	ERJ3GEYJ103	10k	
R160	ERJ3GEYJ563	56k	
R161	ERJ3GEYJ563	56k	
R200	ERJ3GEYJ101	100	
R201	ERJ3GEYJ101	100	

Ref. No.	Part No.	Part Name & Description	Remarks
R203	ERJ3GEYJ473	47k	
R204	ERJ3GEYJ391	390	
R206	ERJ3GEYJ181	180	
R212	ERJ3GEYJ102	1k	
R213	ERJ3GEYJ102	1k	
R214	ERJ3GEYJ102	1k	
R215	ERJ3GEYJ222	2.2k	
R216	ERJ3GEYJ222	2.2k	
R219	ERJ3GEYJ103	10k	
R222	ERJ3GEYJ333	33k	
R223	ERJ3GEYJ222	2.2k	
R225	ERJ3GEYJ102	1k	
R227	ERJ3GEYJ222	2.2k	
R228	ERJ3GEYJ473	47k	
R229	ERJ3GEYJ473	47k	
R230	ERJ3GEY0R00	0	
R231	ERJ3GEY0R00	0	
R232	ERJ3GEY0R00	0	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEY0R00	0	
R251	ERJ3GEYJ102	1k	
R252	ERJ3GEYJ102	1k	
R300	ERJ3GEYJ104	100k	
R301	ERJ3GEYJ103	10k	
R400	ERJ3GEYJ332	3.3k	
R900	ERJ3GEYJ472	4.7k	
R901	ERJ3GEYJ472	4.7k	
R909	ERJ3GEYJ101	100	
R910	ERJ3GEYJ472	4.7k	
R911	ERJ3GEYJ472	4.7k	
R912	ERJ3GEYJ472	4.7k	
C57	ERJ3GEY0R00	0	
C61	ERJ3GEY0R00	0	
J201	ERJ3GEYJ472	0	
J202	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	ECEA1CKA100	10	
C3	ECUV1C473KBV	0.047	
C4	ECUV1H101JCV	100P	
C6	ECUV1H103KBV	0.01	
C8	ECEA1HKA010	1	
C9	ECUV1H103KBV	0.01	S
C14	ECUV1H103KBV	0.01	
C15	PQCUV1A684KB	0.68	
C16	PQCUV1H154KR	0.15	
C17	PQCUV1H154KR	0.15	
C18	ECKD2H681KB	680P	S
C19	ECKD2H681KB	680P	S
C50	ECUV1C104KBV	0.1	
C55	ECUV1H102KBV	0.001	S
C58	ECUV1C104KBV	0.1	
C70	ECEV0JA220	22	
C100	ECUV1C104ZV	0.1	
C101	ECEV0JA101	100	

Ref. No.	Part No.	Part Name & Description	Remarks
C103	ECEA0JU102	1000	
C105	PQCUV1C334KB	0.33	
C106	ECUV1C104ZFV	0.1	
C107	ECEV0JA220	22	
C108	ECEV0JA101	100	
C109	ECUV1H103KBV	0.01	S
C110	ECUV1C104ZFV	0.1	
C112	ECEA1AKA101	100	
C114	ECEA1CKS220	22	S
C150	ECUV1C104ZFV	0.1	
C200	ECUV1C104ZFV	0.1	
C201	ECUV1H681JCV	680P	S
C207	ECUV1C104ZFV	0.1	
C213	ECUV1C104ZFV	0.1	
C227	ECUV1H180JCV	18P	
C228	ECUV1H150JCV	15P	
C230	ECST0JY106	10	
C231	ECUV1C104ZFV	0.1	
C234	ECUV1H103KBV	0.01	S
C235	ECUV1H103KBV	0.01	
C236	ECUV1H103KBV	0.01	
C237	ECST0JY106	10	
C238	ECUV1H103KBV	0.01	S
C239	ECEA0JU331	330	
C241	ECUV1C104ZFV	0.1	
C242	ECUV1H272KBV	0.0027	
C244	ECUV1C104KBV	0.1	
C250	ECUV1C104KBV	0.1	
C251	ECUV1C104ZFV	0.1	
C252	ECUV1C104ZFV	0.1	
C300	ECUV1H101JCV	100P	
C301	ECUV1H101JCV	100P	
C302	ECUV1H101JCV	100P	
C303	ECUV1H101JCV	100P	
C304	ECUV1H101JCV	100P	
C305	ECUV1H101JCV	100P	
C306	ECUV1H101JCV	100P	
C307	ECUV1H101JCV	100P	
C308	ECUV1C104ZFV	0.1	
C309	ECUV1C104ZFV	0.1	
C310	ECUV1H101JCV	100P	
C311	ECUV1H101JCV	100P	
C312	ECUV1H101JCV	100P	
C313	ECUV1H101JCV	100P	
C315	ECUV1H101JCV	100P	
C401	ECUV1H103KBV	0.01	S
C403	ECUV1H330JCV	33P	
C404	ECUV1H101JCV	100P	
C405	ECUV1H101JCV	100P	
C406	ECUV1H101JCV	100P	
C407	ECUV1H101JCV	100P	
C408	ECUV1H101JCV	100P	
C409	ECUV1H030CCV	3P	
C410	ECUV1H101JCV	100P	

Ref. No.	Part No.	Part Name & Description	Remarks
C411	ECUV1H101JCV	100P	
C412	ECUV1H101JCV	100P	
C413	ECUV1C104KBV	0.1	
C415	ECEV0JA220	22	
C450	ECEV0JA101	100	
C453	ECUV1H030CCV	3P	
C723	ECUV1C563KBV	0.056	

23.1.3. RF P.C.BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQLP10246Z	RF BLOCK	

23.2. Handset

23.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQAS3P07Y	SPEAKER	
102	PQAX3P27Z	RECEIVER	
103	PQBC10341Z1	NAVIKEY BUTTON	S
104	PQSA10102X	ANTENNA (KX-TC1503B)	S
104	PQSA10102W	ANTENNA (KX-TC1503W)	S
105	PQGT14617Z	NAME LABEL	
106	PQHE10121Z	CUSHION, URETHANE FORM	
107	PQHG10589Y	SP RUBBER SHEET	
108	PQHR10778Z	SP HOLDER	
109	PQHR10855Z	SP HOLDER	
110	PQHR10865Z	LED LENSE	
111	PQHS10457Z	SP NET	
112	PQP504SVC	BATTERY	S
113	PQSX10174Y	KEY RUBBER SWITCH (KX-TC1503B)	
113	PQSX10174W	KEY RUBBER SWITCH (KX-TC1503W)	
114	PQJT10176Z	CHARGE TERMINAL (L)	
115	PQJT10177Z	CHARGE TERMINAL (R)	
116	PQKE10132Z1	EARPHONE CAP	S
117	PQKM10486Y1	FRONT CABINET (KX-TC1503B)	S
117	1AKM10486Y4	FRONT CABINET (KX-TC1503W)	S
118	PQKK10120Z1	BATTERY COVER (KX-TC1503B)	S
118	PQKK10120Z2	BATTERY COVER (KX-TC1503W)	S
119	PQKF10518Z1	REAR CABINET (KX-TC1503B)	S
119	PQKF10518Z2	REAR CABINET (KX-TC1503W)	S

23.2.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPTC1503BR	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC201	C2HBBG000014	IC	
IC202	PQWITC1503BR	IC	
IC203	C0CBABD00011	IC	
IC204	PQVIC62FP33M	IC	S
IC205	PQVIC61CN32N	IC	S
		(TRANSISTORS)	
Q205	2SD1819A	TRANSISTOR(SI)	
Q206	PQVTDTC143E	TRANSISTOR(SI)	S
Q207	2SD1819A	TRANSISTOR(SI)	
Q211	PQVTDTA143TU	TRANSISTOR(SI)	
		(DIODES)	
D201	MA2ZD1400	DIODE(SI)	
D203	MA111	DIODE(SI)	
D206	PQVDS1ZB60F1	DIODE(SI)	
D211	MA8100M	DIODE(SI)	
D214	MA111	DIODE(SI)	
D215	MA2ZD1400	DIODE(SI)	
D216	MA111	DIODE(SI)	
		(LEDS)	
LED208	PQVDSML310MT	LED	S
LED209	PQVDEL1921SR	LED	
LED210	PQVDSML310MT	LED	S
		(COILS)	
L201	MQLRE15NJF	COIL	
L203	PQLQR3FL121	COIL	S
L211	PQLQR4RB601D	COIL	
L212	PQLQR4RB601D	COIL	
		(CONNECTORS)	
CN202	PQJP2D13Z	CONNECTOR PIN	S
CN203	PQJJ1J007Z	EAR JACK	S
		(OTHERS)	
E101	PQJM147Y	MICROPHONE	
G1	PQJT10152Z	CHARGE TERMINAL	
G2	PQJT10152Z	CHARGE TERMINAL	
G3	PQJT10152Z	CHARGE TERMINAL	
G4	PQJT10152Z	CHARGE TERMINAL	
G5	PQJT10152Z	CHARGE TERMINAL	
G6	PQJT10152Z	CHARGE TERMINAL	
X201	H0J409400006	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R209	ERJ3GEYJ102	1k	
R210	ERJ3GEYJ103	10k	
R211	ERJ3GEYJ103	10k	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R214	ERJ3GEYJ331	330	
R215	ERJ3GEYJ681	680	
R216	ERJ3GEYJ331	330	
R222	ERJ3GEYJ101	100	
R224	ERJ3GEYJ103	10k	
R225	ERJ3GEYJ472	4.7k	
R228	ERJ3GEYJ224	220k	

Ref. No.	Part No.	Part Name & Description	Remarks
R229	ERJ3GEYJ102	1k	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ103	10k	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEYJ225	2.2M	
R235	ERJ3GEYJ225	2.2M	
R236	ERJ3GEYJ473	47k	
R241	ERJ3GEY0R00	0	
R244	ERJ3GEYJ473	47k	
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ153	15k	
R247	ERJ3GEYJ391	390	
R248	ERJ3GEYJ393	39k	
R249	ERJ3GEYJ222	2.2k	
R250	ERJ3GEYJ222	2.2k	
R253	ERJ3GEYJ222	2.2k	
R260	ERJ3GEYJ103	10k	
R265	ERJ3GEYJ103	10k	
R270	ERJ3GEYJ104	100k	
R271	ERJ3GEYJ104	100k	
R272	ERJ3GEYJ104	100k	
R300	ERJ3GEYJ104	100k	
R302	ERJ3GEYJ180	18	
R303	ERJ3GEYJ180	18	
C301	ERJ3GEY0R00	0	
L209	PQ4R10XJ000	0	S
		(CAPACITORS)	
C203	ECUV1C104ZFV	0.1	
C205	ECUV1H101JCV	100P	
C213	ECEV0JA101	100	
C214	ECUV1C104ZFV	0.1	
C217	ECUV1C104ZFV	0.1	
C218	ECUV1C104ZFV	0.1	
C220	ECEV0JA101	100	
C221	ECUV1C104ZFV	0.1	
C222	ECUV1C104ZFV	0.1	
C223	ECST0JY106	10	
C224	ECUV1C104ZFV	0.1	
C225	ECUV1C104ZFV	0.1	
C226	ECUV1C104ZFV	0.1	
C227	ECUV1C104ZFV	0.1	
C228	ECUV1C104ZFV	0.1	
C229	ECUV1A105ZFV	1	
C230	ECUV1E333KBV	0.033	
C231	ECUV1A224KBV	0.22	
C232	ECUV1E333KBV	0.033	
C233	ECUV1A105ZFV	1	
C234	ECUV1A224KBV	0.22	
C236	ECUV1H150JCV	15P	
C237	ECUV1H150JCV	15P	
C239	ECUV1C104ZFV	0.1	
C242	ECUV1C104ZFV	0.1	
C255	ECUV1A224KBV	0.22	

Ref. No.	Part No.	Part Name & Description	Remarks
C257	ECST0JY226	22	
C262	ECUV1A105ZFV	1	
C267	ECST0JX226	22	
C270	ECST0JY475	4.7	
C274	ECUV1C104ZFV	0.1	
C277	ECUV1C563KBV	0.056	
C279	ECUV1H010CCV	1P	
C280	ECUV1C104ZFV	0.1	
C282	ECUV1C104ZFV	0.1	
C285	ECUV1C105ZF	1	
C291	ECUV1C104ZFV	0.1	
C294	ECUV1C104ZFV	0.1	
C303	ECST0JY106	10	
C304	ECUV1C104ZFV	0.1	
C305	ECUV1H030CCV	3P	

23.2.3. RF P.C.BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQLP10246Z	RF BLOCK	

23.2.4. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	KX-TCA1-G	AC ADAPTOR	
A2	PQJA10075Z	TEL CORD	
A3	PQKE10130Z1	BELT CLIP (KX-TC1503B)	S
A3	PQKE10130Z2	BELT CLIP (KX-TC1503W)	S
A4	PQKL10035Z1	WALL MOUNT ADAPTOR (KX-TC1503B)	S
A4	PQKL10035Z2	WALL MOUNT ADAPTOR (KX-TC1503W)	S
A5	PQQW12431Z	QUICK GUIDE (for English)	
A6	PQQW12432Z	QUICK GUIDE (for Spanish)	
A7	PQQX13049Z	INSTRUCTION BOOK	
P1	PQPP170Y	PROTECTION COVER (for Base Unit)	
P2	XZB10X35A02	PROTECTION COVER (for Handset)	
P3	PQPK13410Z	CARTON BOX (KX-TC1503B)	
P3	PQPK13473Z	CARTON BOX (KX-TC1503W)	
P4	PQPD10469Z	CUSHION	
P5	PQXDDS400-8	SECURITY TAG	
P6	PQXDZLDRS1	SECURITY TAG	

24. FOR SCHEMATIC DIAGRAM

24.1. Base Unit (**SCHEMATIC DIAGRAM (Base Unit)**)

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:

Components identified by $\triangle$ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

24.2. Handset (**SCHEMATIC DIAGRAM (Handset)**)

Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

24.3. Memo

25. SCHEMATIC DIAGRAM (RF Unit)

26. SCHEMATIC DIAGRAM (Base Unit)

27. SCHEMATIC DIAGRAM (Handset)

28. CIRCUIT BOARD (RF Unit)

29. CIRCUIT BOARD (Base Unit)

29.1. Component View

29.2. Flow Solder Side View

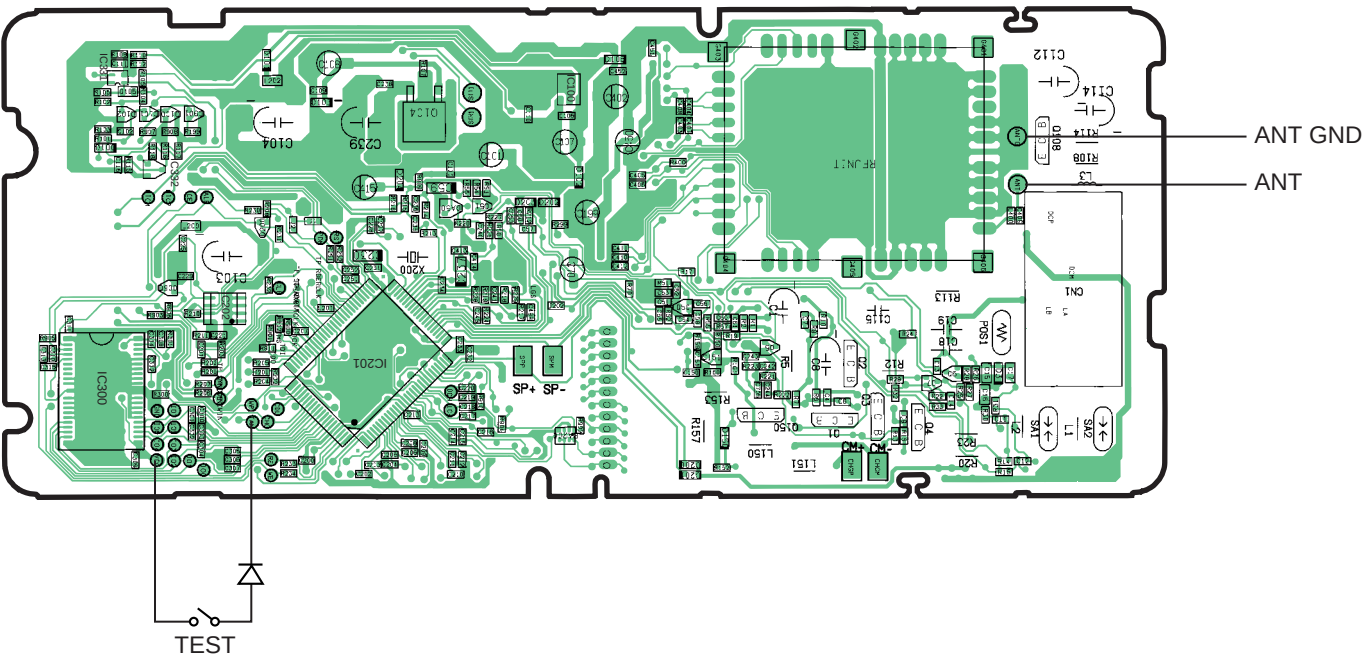
30. CIRCUIT BOARD (Handset)

30.1. Component View

30.2. Flow Solder Side View

M / KXTC1503B-AK / KXTC1503W-AK / Printed in Japan

(COMPONENT VIEW)



(FLOW SOLDER SIDE VIEW)

This diagram shows the flow solder side of the PCB. It features a green solder mask with white conductive traces. Various components are visible, including integrated circuits (ICs) like the 74VHC00, 74VHC04, and 74VHC14, as well as resistors (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100), capacitors (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100), and other components like LEDs (LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8, LED9, LED10, LED11, LED12, LED13, LED14, LED15, LED16, LED17, LED18, LED19, LED20, LED21, LED22, LED23, LED24, LED25, LED26, LED27, LED28, LED29, LED30, LED31, LED32, LED33, LED34, LED35, LED36, LED37, LED38, LED39, LED40, LED41, LED42, LED43, LED44, LED45, LED46, LED47, LED48, LED49, LED50, LED51, LED52, LED53, LED54, LED55, LED56, LED57, LED58, LED59, LED60, LED61, LED62, LED63, LED64, LED65, LED66, LED67, LED68, LED69, LED70, LED71, LED72, LED73, LED74, LED75, LED76, LED77, LED78, LED79, LED80, LED81, LED82, LED83, LED84, LED85, LED86, LED87, LED88, LED89, LED90, LED91, LED92, LED93, LED94, LED95, LED96, LED97, LED98, LED99, LED100). The board is labeled with various functions and components, including LOT, DMN, UP, SP, HLD/RNG, FLS, RDL, PRG/AUT, MSG, STP, ANS, REP, SKIP, C400, D107, D108, D109, D110, D111, D112, D113, D114, D115, D116, D117, D118, D119, D120, D121, D122, D123, D124, D125, D126, D127, D128, D129, D130, D131, D132, D133, D134, D135, D136, D137, D138, D139, D140, D141, D142, D143, D144, D145, D146, D147, D148, D149, D150, D151, D152, D153, D154, D155, D156, D157, D158, D159, D160, D161, D162, D163, D164, D165, D166, D167, D168, D169, D170, D171, D172, D173, D174, D175, D176, D177, D178, D179, D180, D181, D182, D183, D184, D185, D186, D187, D188, D189, D190, D191, D192, D193, D194, D195, D196, D197, D198, D199, D200. Two lines, Line A and Line B, are shown pointing to specific components on the board.

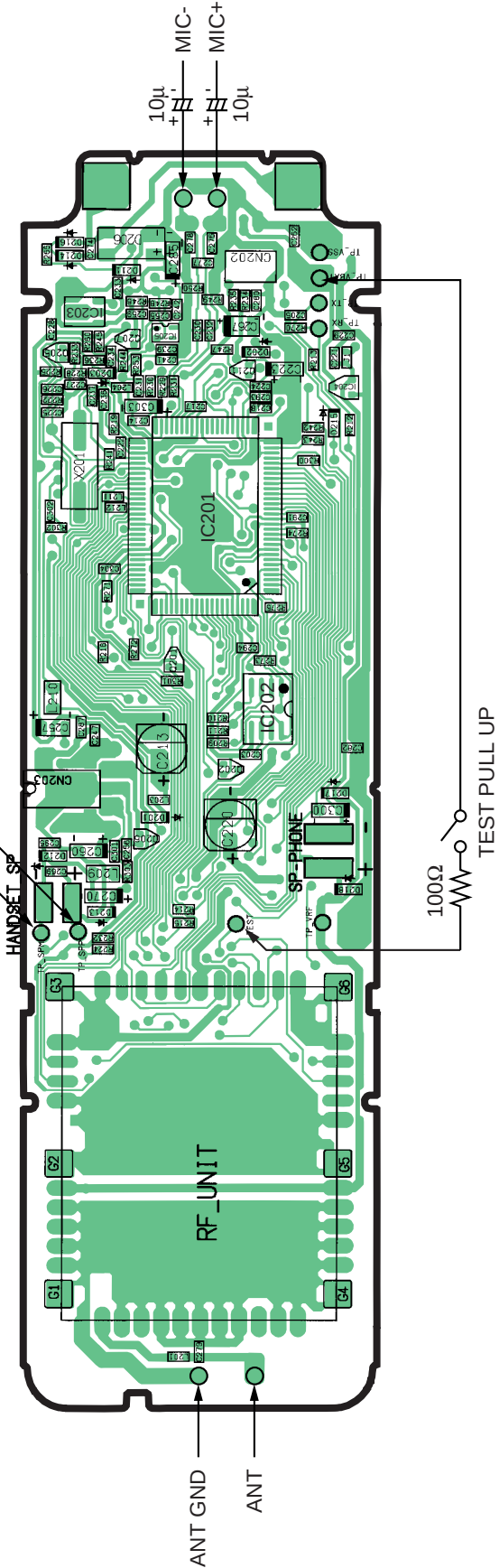
(FLOW SOLDER SIDE VIEW)

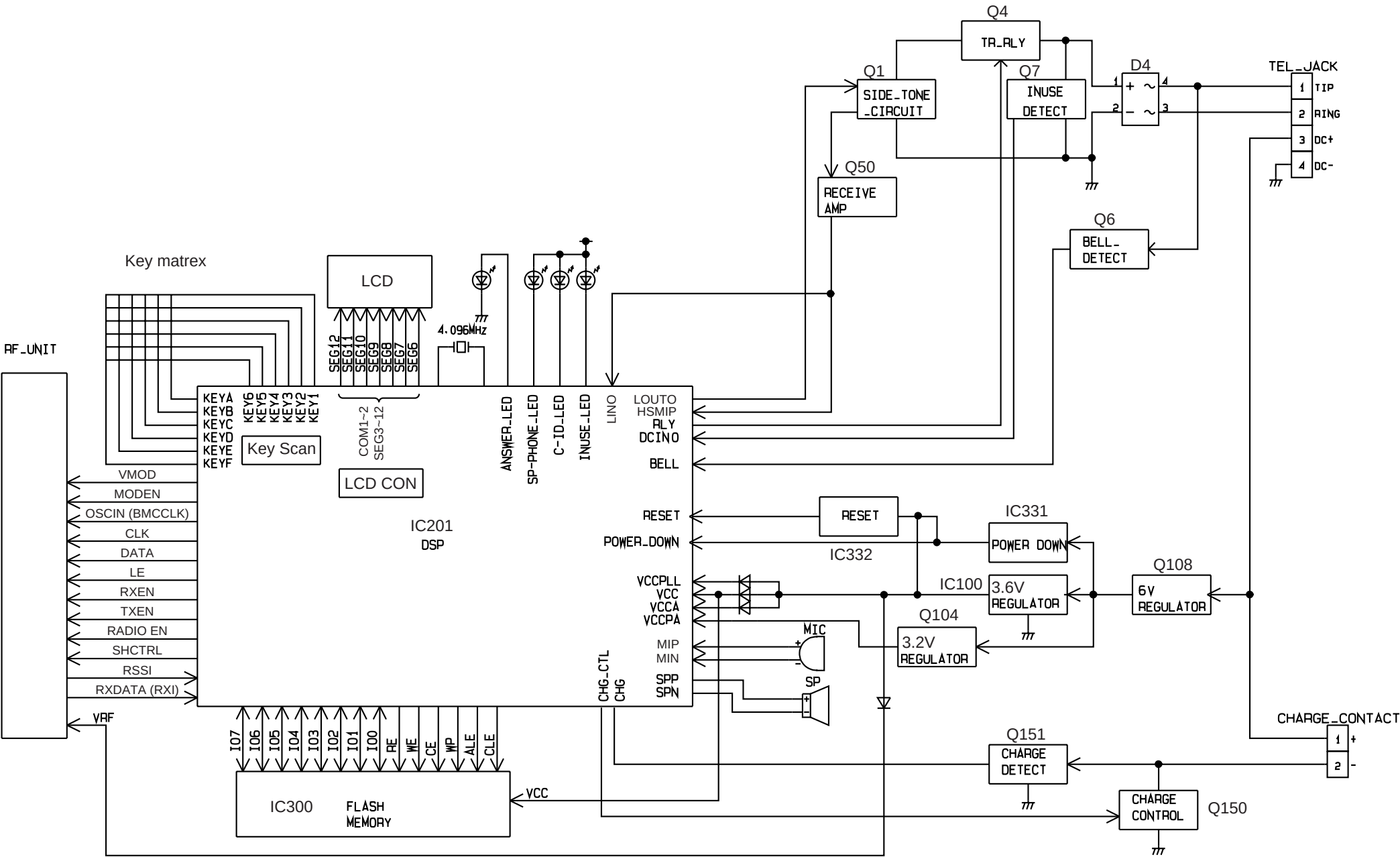
This diagram shows the flow solder side of the PCB. It features a green solder mask with white conductive traces. Various components are visible, including integrated circuits (ICs) like the 74VHC00, 74VHC04, and 74VHC14, as well as resistors (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100), capacitors (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100), and other components like LEDs (LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8, LED9, LED10, LED11, LED12, LED13, LED14, LED15, LED16, LED17, LED18, LED19, LED20, LED21, LED22, LED23, LED24, LED25, LED26, LED27, LED28, LED29, LED30, LED31, LED32, LED33, LED34, LED35, LED36, LED37, LED38, LED39, LED40, LED41, LED42, LED43, LED44, LED45, LED46, LED47, LED48, LED49, LED50, LED51, LED52, LED53, LED54, LED55, LED56, LED57, LED58, LED59, LED60, LED61, LED62, LED63, LED64, LED65, LED66, LED67, LED68, LED69, LED70, LED71, LED72, LED73, LED74, LED75, LED76, LED77, LED78, LED79, LED80, LED81, LED82, LED83, LED84, LED85, LED86, LED87, LED88, LED89, LED90, LED91, LED92, LED93, LED94, LED95, LED96, LED97, LED98, LED99, LED100). The board is labeled with various functions and components, including LOT, DMN, UP, SP, HLD/RNG, FLS, RDL, PRG/AUT, MSG, STP, ANS, REP, SKIP, C400, D107, D108, D109, D110, D111, D112, D113, D114, D115, D116, D117, D118, D119, D120, D121, D122, D123, D124, D125, D126, D127, D128, D129, D130, D131, D132, D133, D134, D135, D136, D137, D138, D139, D140, D141, D142, D143, D144, D145, D146, D147, D148, D149, D150, D151, D152, D153, D154, D155, D156, D157, D158, D159, D160, D161, D162, D163, D164, D165, D166, D167, D168, D169, D170, D171, D172, D173, D174, D175, D176, D177, D178, D179, D180, D181, D182, D183, D184, D185, D186, D187, D188, D189, D190, D191, D192, D193, D194, D195, D196, D197, D198, D199, D200. Two lines, Line A and Line B, are shown on the right side of the board, pointing to specific components.

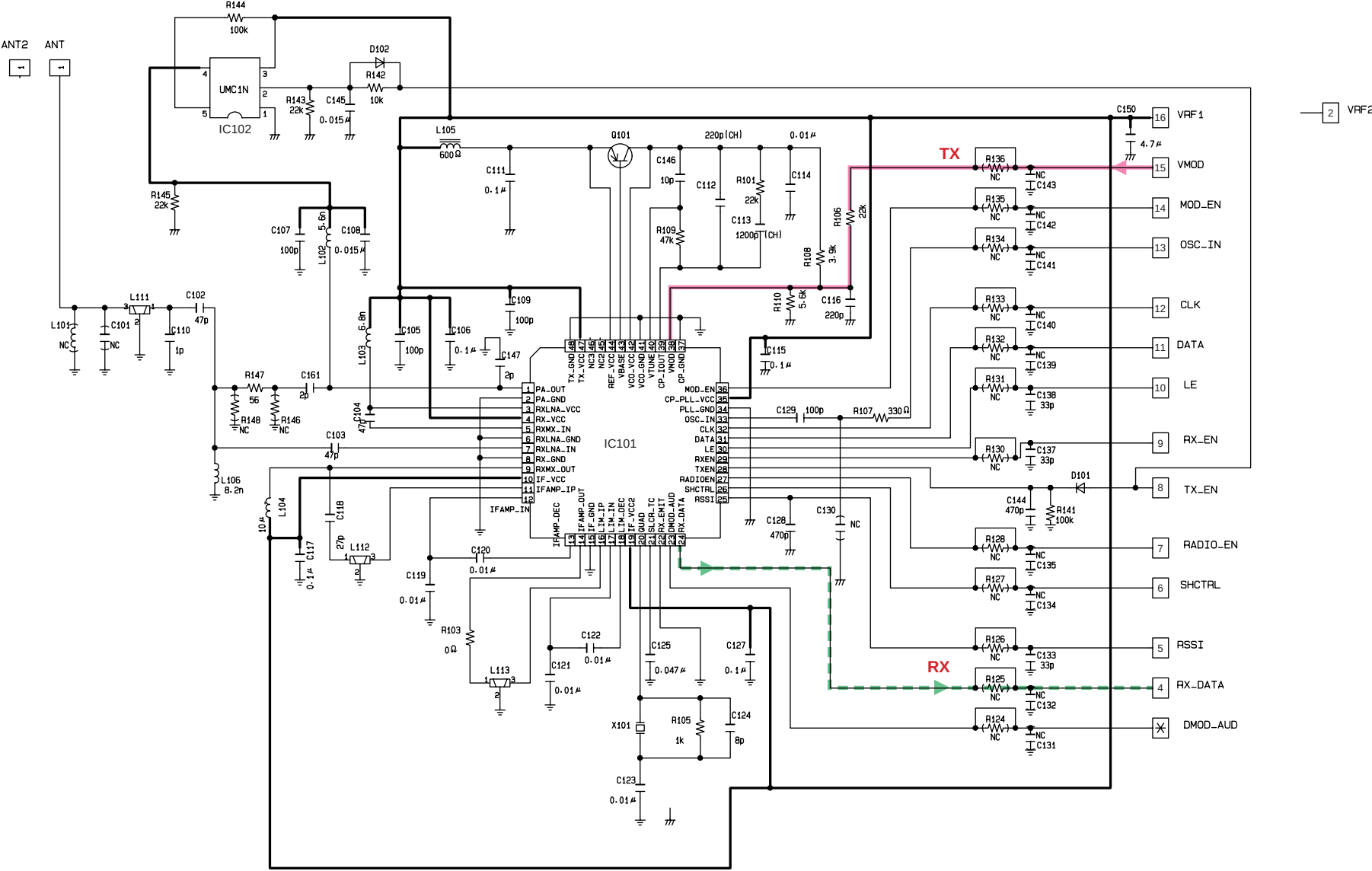
(FLOW SOLDER SIDE VIEW)

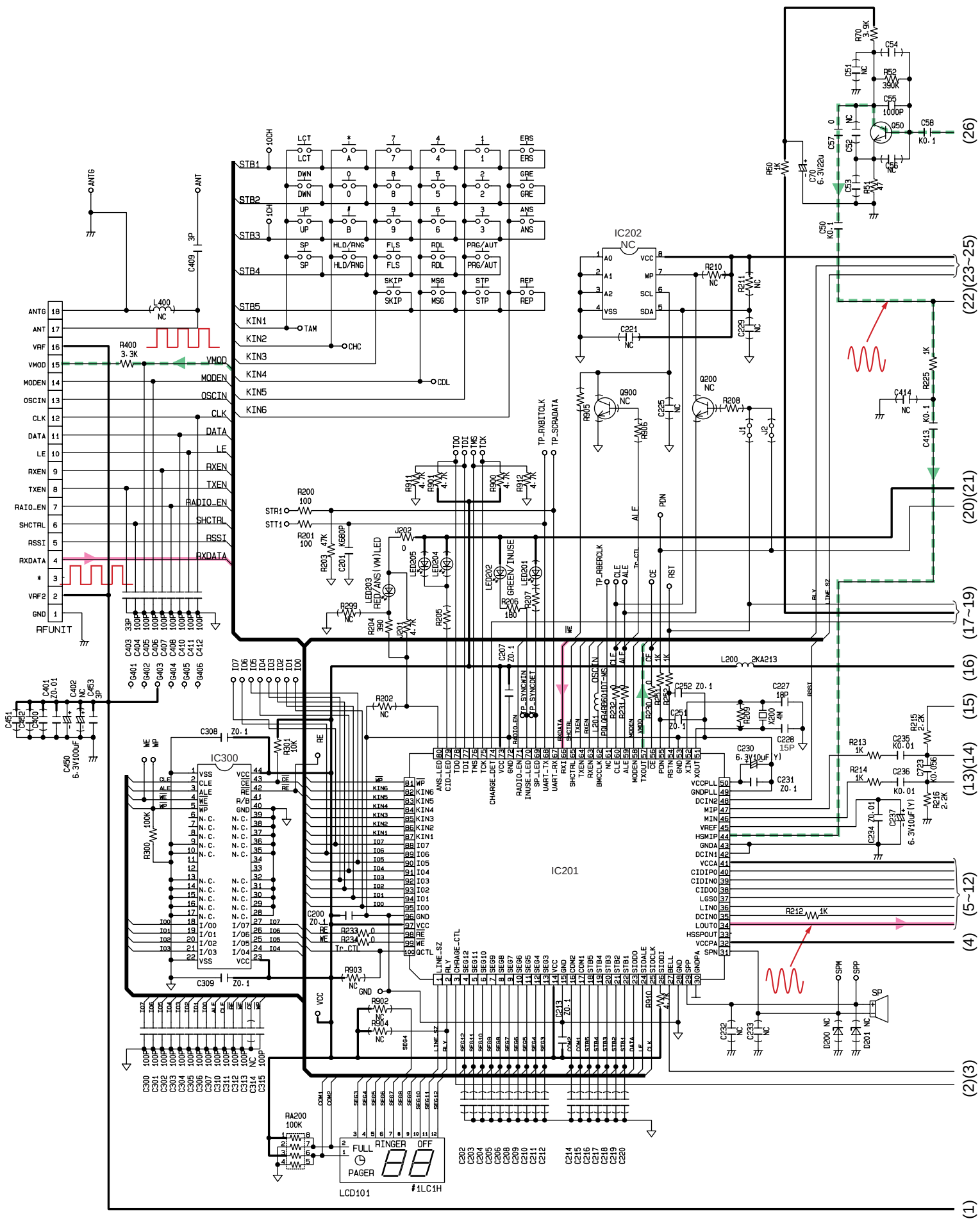
This diagram shows the flow solder side of the PCB. It features a green solder mask with white conductive traces. Various components are visible, including integrated circuits (ICs) like the 74VHC00, 74VHC04, and 74VHC14, as well as resistors (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100), capacitors (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100), and other components like LEDs (LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8, LED9, LED10, LED11, LED12, LED13, LED14, LED15, LED16, LED17, LED18, LED19, LED20, LED21, LED22, LED23, LED24, LED25, LED26, LED27, LED28, LED29, LED30, LED31, LED32, LED33, LED34, LED35, LED36, LED37, LED38, LED39, LED40, LED41, LED42, LED43, LED44, LED45, LED46, LED47, LED48, LED49, LED50, LED51, LED52, LED53, LED54, LED55, LED56, LED57, LED58, LED59, LED60, LED61, LED62, LED63, LED64, LED65, LED66, LED67, LED68, LED69, LED70, LED71, LED72, LED73, LED74, LED75, LED76, LED77, LED78, LED79, LED80, LED81, LED82, LED83, LED84, LED85, LED86, LED87, LED88, LED89, LED90, LED91, LED92, LED93, LED94, LED95, LED96, LED97, LED98, LED99, LED100). The board is labeled with various functions and components, including LOT, DMN, UP, SP, HLD/RNG, FLS, RDL, PRG/AUT, MSG, STP, ANS, REP, SKIP, C400, D107, D108, D109, D110, D111, D112, D113, D114, D115, D116, D117, D118, D119, D120, D121, D122, D123, D124, D125, D126, D127, D128, D129, D130, D131, D132, D133, D134, D135, D136, D137, D138, D139, D140, D141, D142, D143, D144, D145, D146, D147, D148, D149, D150, D151, D152, D153, D154, D155, D156, D157, D158, D159, D160, D161, D162, D163, D164, D165, D166, D167, D168, D169, D170, D171, D172, D173, D174, D175, D176, D177, D178, D179, D180, D181, D182, D183, D184, D185, D186, D187, D188, D189, D190, D191, D192, D193, D194, D195, D196, D197, D198, D199, D200. Two lines, Line A and Line B, are shown on the right side of the board, pointing to specific components.

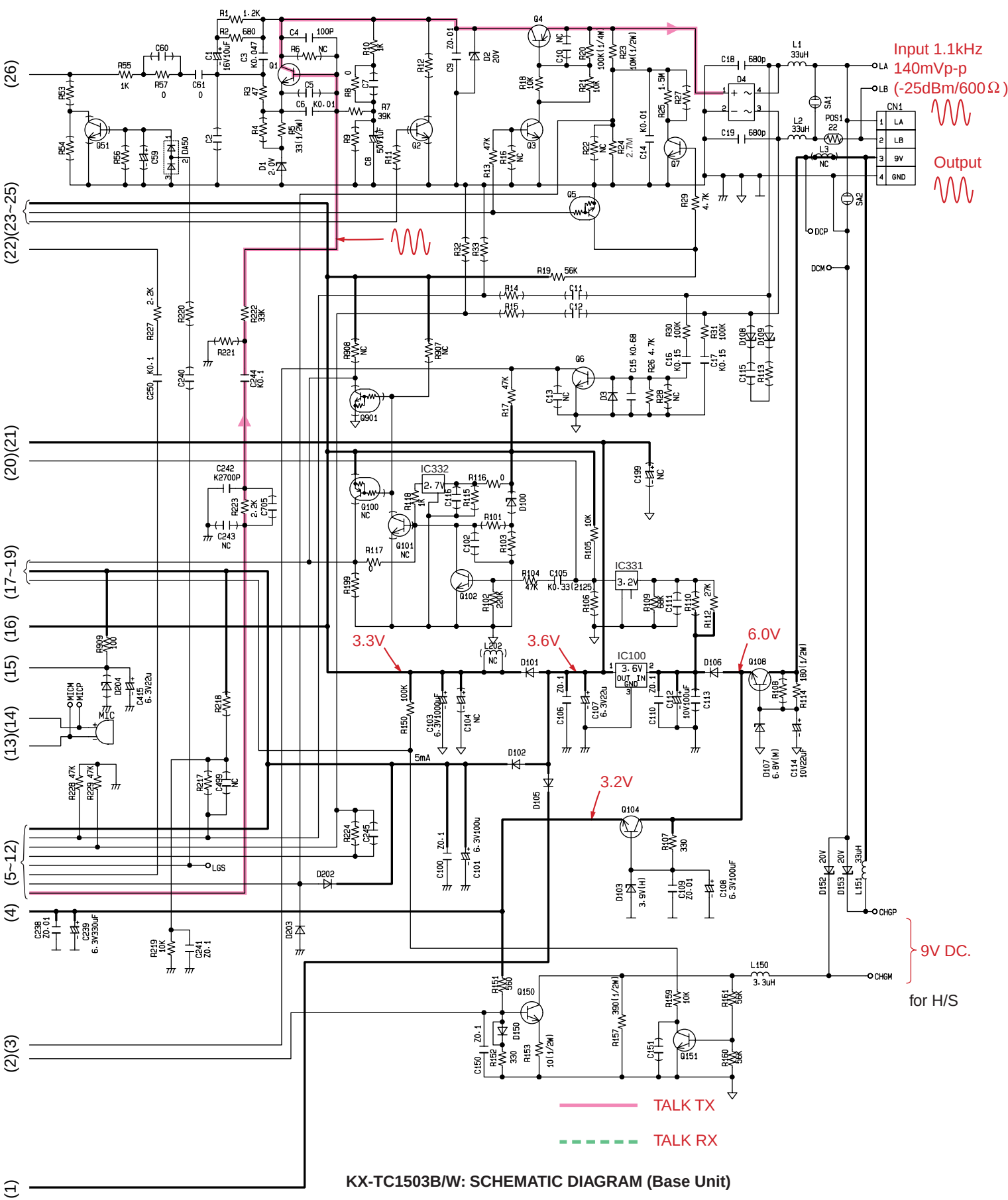
(COMPONENT VIEW)



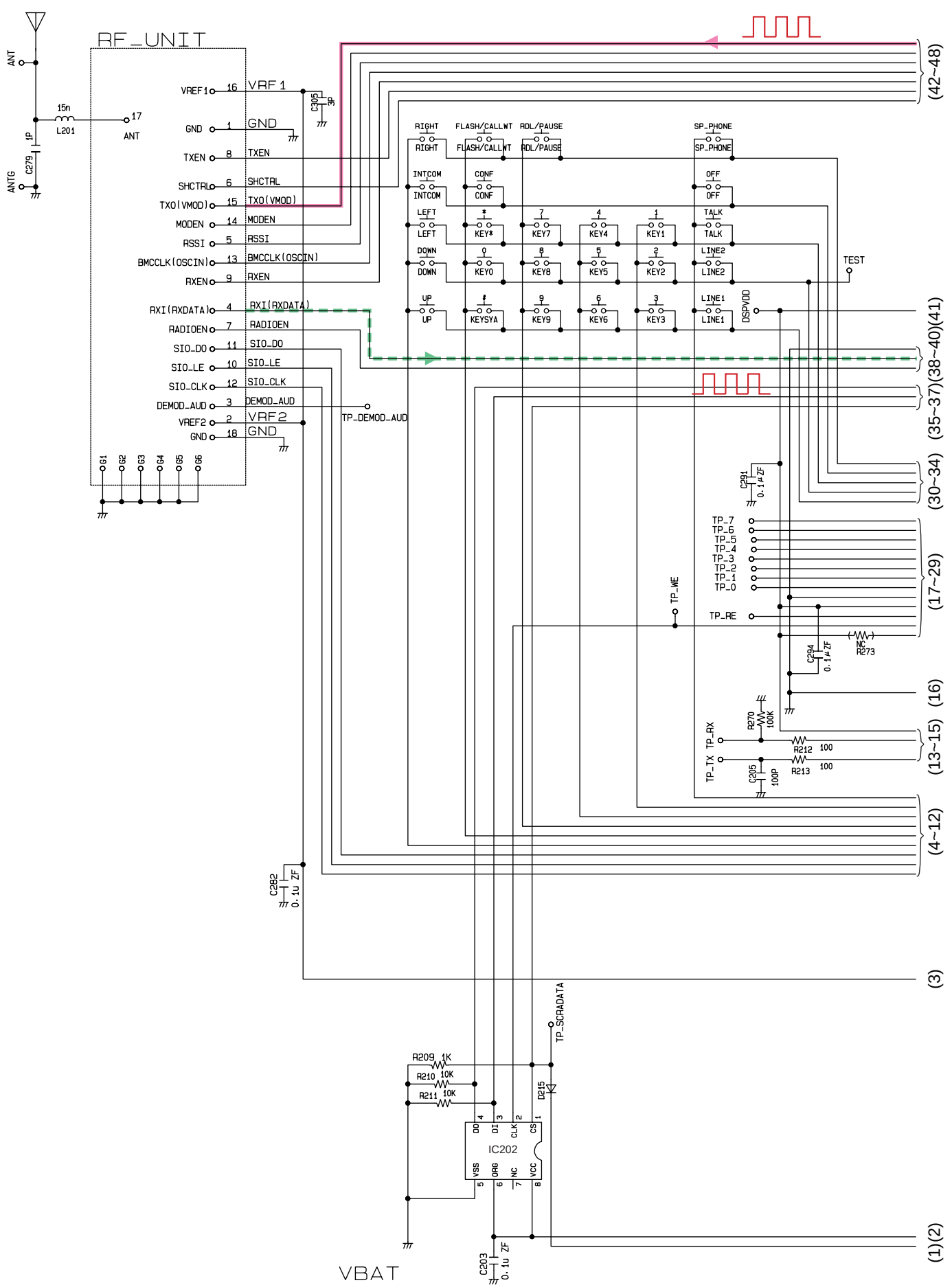


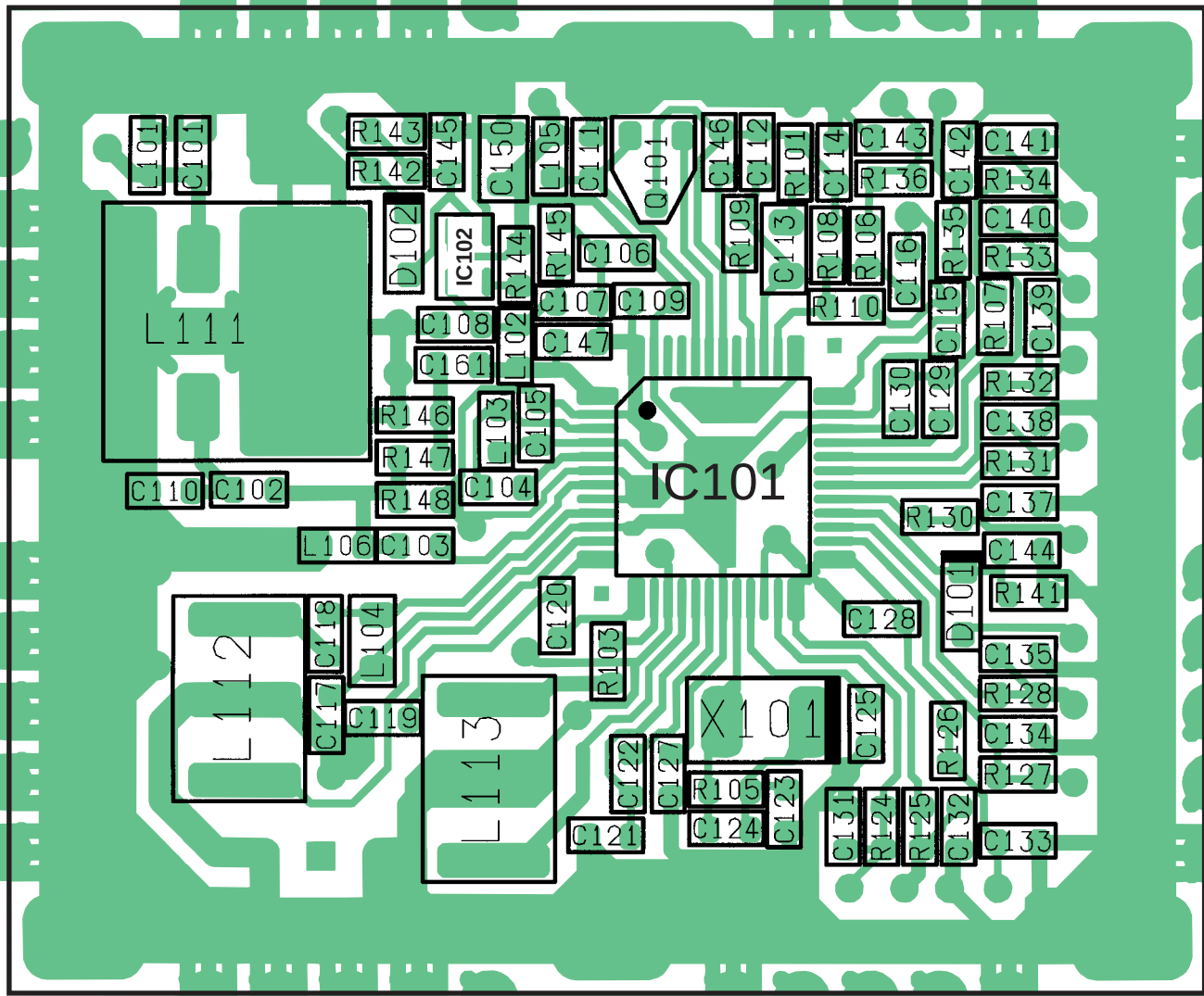


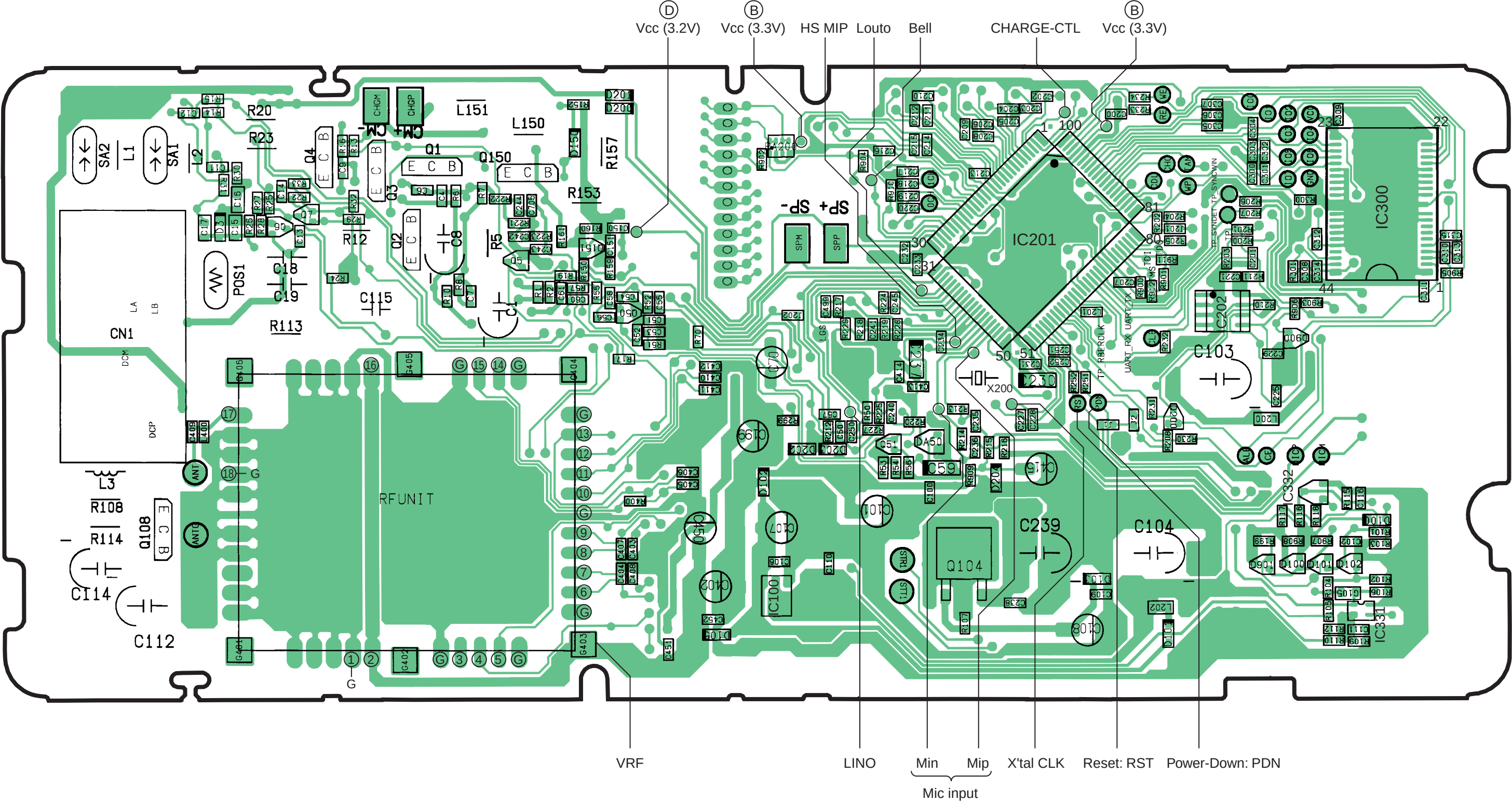


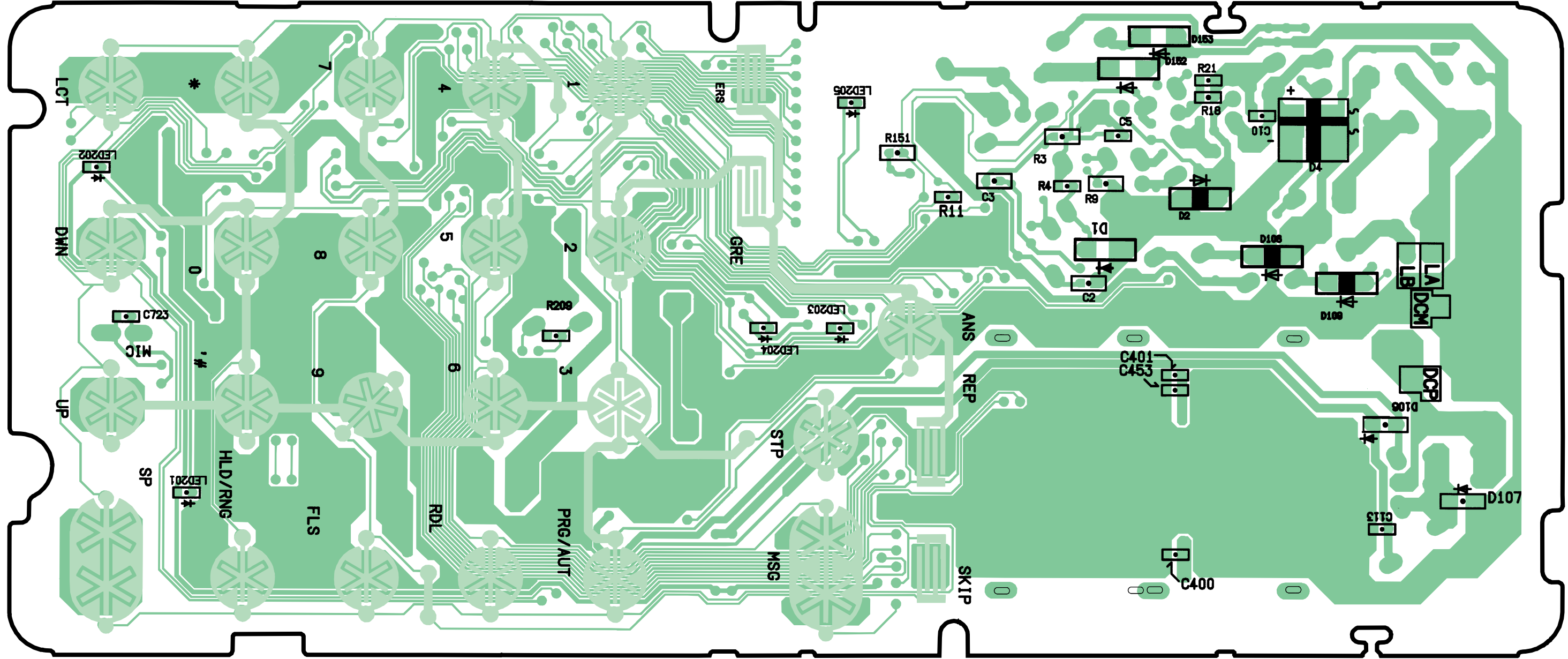


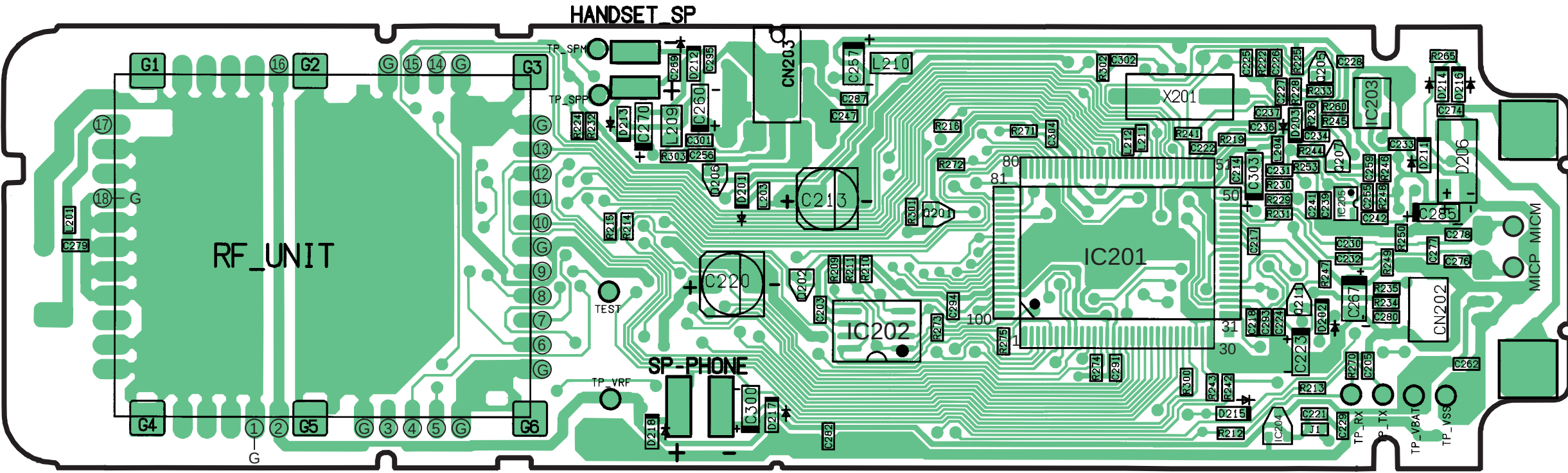
KX-TC1503B/W: SCHEMATIC DIAGRAM (Base Unit)

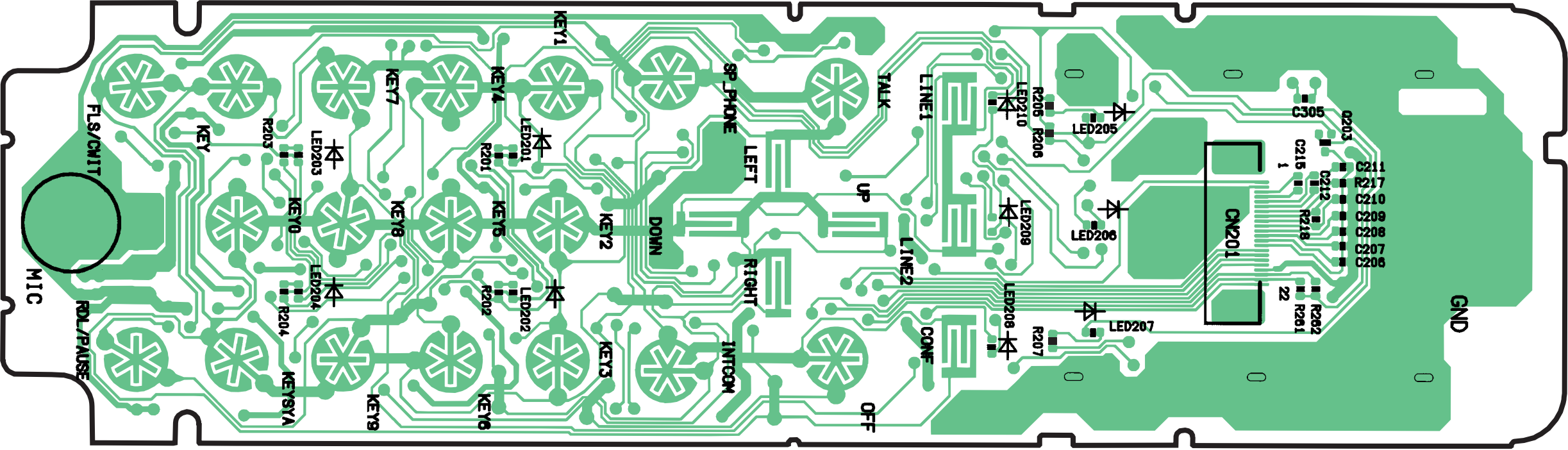












Service Manual

Telephone Equipment



KX-TC1503B KX-TC1503W

900MHz Digital Cordless Answering System

Black Version

White Version

(for U.S.A.)

(for Panama)

Please file and use this supplement manual together with the service manual mentioned below.

Model No.	Order No.	Sup. No.	Countries/Areas
KX-TC1503B/KX-TC1503W	KM40106816C7	2	U.S.A.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

	Page		Page
1 CHANGES	2	2 SUP-1 (KM40108802S7)	3
1.1. REPLACEMENT PARTS LIST	2		

1 CHANGES

1.1. REPLACEMENT PARTS LIST

1.1.1. REFERENCE CHART

Reason for Change	
*The following items (1-8) indicate the reason for change. See the "Notes" column for each part in ORIGINAL AND NEW PARTS COMPARISON LISTS .	
1. Improve performance	Remarks: a. To share with other models.
2. Change of material or dimension	
3. To meet approved specification	
4. Standardization	
5. Addition	
6. Deletion	
7. Correction	
8. Other	

Interchangeability Code		
**The following items (V-Z) indicate the Interchangeability. See the "Notes" column for each part in ORIGINAL AND NEW PARTS COMPARISON LISTS .		
V	Original ↗ Early (before change) New ↘ Late (after change)	Original or new parts may be used in early or late production sets. Use original parts until exhausted, then stock new parts.
W	Original ↗ Early (before change) New ↘ Late (after change)	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
X	Original ↗ Early (before change) New ↘ Late (after change)	New parts only may be used in early or late production sets. Stock new parts.
Y	Original → Early (before change) New → Late (after change)	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
Z	Other	

Note:

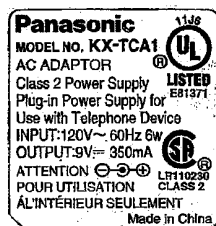
Alphabets in the "Remarks" column in the following lists correspond to the alphabets in the "Remarks" in REFERENCE CHART.

1.1.2. ORIGINAL AND NEW PARTS COMPARISON LISTS

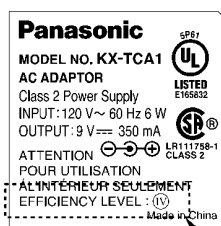
(for KX-TC1503B/KX-TC1503W)

Ref. No.	Part No.		Part Name & Description	Pcs/ Set	Remarks	Notes		Time of Change (Suffix)
	Original (Old)	New						
A1	KX-TCA1-G	KX-TCA1-3	AC Adaptor ⚠	1	a	4	W	-

The label of AC Adaptor has been changed as shown below.



[Old]



[New]

→ Addition

2 SUP-1 (KM40108802S7)

ORDER NO. KM40108802S7

F11

Service Manual

Telephone Equipment



KX-TC1503B

900MHz Digital Cordless Answering
System

Black Version

(for U.S.A.)

(for Panama)

Please file and use this supplement manual together with the service manual for Model No. KX-TC1503B,
Order No.KM40106816C7.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

© 2001 Kyushu Matsushita Electric Co., Ltd. All rights reserved. Unauthorized copying and distribution is a violation of law.

KX-TC1503B

1 CHANGES

This supplement has been issued for changes of the parts No. of CPU and electrical parts, etc.

1.1. REPLACEMENT PARTS LIST

Reason for Change		The following reasons (1-8) are indicated in the Notes below.	
1. Improve performance			
2. Change of material or dimension			
3. To meet approved specification			
4. Standardization			
5. Addition			
6. Deletion			
7. Correction			
8. Other			
Interchangeability Code		The following interchangeabilities (V-Z) are indicated in the Notes below.	
Parts	Set Production	Description	
V	Original  Early (before change) New  Late (after change)	Original or new parts may be used in early or late production sets. Use original parts until exhausted, then stock new parts.	
W	Original  Early (before change) New  Late (after change)	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.	
X	Original  Early (before change) New  Late (after change)	New parts only may be used in early or late production sets. Stock new parts.	
Y	Original  Early (before change) New  Late (after change)	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.	
Z	Other		

Ref. No.	Part No.		Part Name & Description	Pcs/ Set	Implementation	Suffix	Notes	
	Original (Old)	New						
Base Unit								
17	-----	PQXDZLDRS1	Security Tag	1	Jul.'01	A	5	
IC201	C2HBBG000011	C2HBBG000026	IC	1	Jul.'01	A	4	W
Handset								
IC201	C2HBBG000014	C2HBBG000020	IC	1	May.'01	A	8	W
	C2HBBG000020	C2HBBG000024	IC	1	Jul.'01	B	4	W
C220	CECV0JA101	ECEV0GA102P	Capacitor, 1000μF	1	Jul.'01	B→C	1	X

2 CABINET AND ELECTRICAL PARTS

